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Laparoscopic management of benign adnexal masses: Two years' experience

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Abstract

Objective:*Our objective is to evaluate the safety and reliability of laparoscopy in the management of benign adnexal masses in patients with diversity of presentations through a retrospective study.*

Methods:*We analyzed data from 41 patients who were admitted to King Abdulaziz Hospital, Obstetrics and Gynecology Department through outpatient clinic, emergency department and referred from other hospitals. All patients were diagnosed as benign adnexal mass and underwent laparoscopy for both diagnostic confirmation and management. Laparoscopy was performed after fulfillment of the diagnostic work up of benign adnexal masses.*

Results*: All the study cases were operated successfully by operative laparoscopy. High BMI , pregnancy, and large adenexal masses were not limitations for the procedure. Fertility potentials were preserved in most of cases Long operative time was noticed. Operative and post operative parameters were comparable to former studies.*

Conclusion*: Laparoscopic approach can be considered the gold standard surgical approach for the management of benign adnexal masses. It can be offered for patients who want to preserve their fertility potential. It can be successfully performed on patients with benign adnexal masses regardless of the size of the mass and with low risk in patients with intraperitoneal adhesions when done by skilled team.*

Keywords:*Laparoscopy, benign, adnexal masses, management.*

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Introduction:

Adnexal masses are common clinical problem affecting women of all ages [1]. Women with adnexal masses may present with acute torsion or rupture of cystic lesions and peritoneal signs that require immediate surgical intervention; however, the vast majority of cases are discovered incidentally during imaging or pelvic examination [2,3]. Laparoscopy has the potential to completely and successfully treat benign adnexal masses while decreasing unnecessary morbidity among patients [1]. As far as benign ovarian pathology is concerned, laparoscopy is superior to laparotomy in terms of visualization of abdominal contents and for adequate inspection of contralateral adnexa [4]. Previous studies showed favorable surgical outcomes of laparoscopy such as, less intraoperative bleeding, short recovery time, better cosmetic effect, decreased adhesions formation and maintaining patient's future fertility prospects when managing benign adnexal lesions [1,4,5]. This retrospective study investigates and discusses the value of laparoscopy in the diagnosis and management of benign adnexal masses.

Materials and methods:

A retrospective study was carried out on 41 patients admitted to Obstetrics and Gynecology Department, King Abdulaziz Hospital, through outpatient clinic, emergency department, or referred from other hospitals between January 2018 and April 2020. The preoperative diagnostic work up of benign adnexal masses was done for all patients. Laparoscopy was performed for diagnostic confirmation and management.

Inclusion criteria:

All patients diagnosed with benign adnexal mass followed by laproscopy were included in this study in years between 2018 to 2020. Data were collected from patients' files provided by ***King Abdulaziz Hospital, Obstetrics and Gynecology Department.*** *Demographic data and clinical history (age, marital status, obstetric code, BMI, concomitant pregnancy, and history of previous laparotomy) as well as patient presentation, laparoscopic access, findings, procedure, operative time, intraoperative complications, early and late postoperative complications, hospital stay, size of the mass and histopathology data were collected.*

Preoperative assessment of adnexal masses was performed for all patients by full medical history, complete physical examination, imaging (either CT scan or MRI and standard sonographic pelvic assessment were performed to all the patients) and biomarkers evaluation.

Possibility of malignant conditions was eliminated depending on a combination of the following: i-All standard sonographic criteria adopted by the International Ovarian Tumor Analysis Group

except color Doppler (no M features). ii- Negative biomarkers of ovarian malignancy (ca125, alpha fetoprotein, ca19.9 and beta HCG). iii- Pelvic CT Scan or MRI. iv- Cases that showed intraoperative findings suggestive of malignancy were excluded[6-10]. Pregnancy test by serum level of beta subunit of HCG was done to roll out ectopic and intrauterine pregnancies.

Laparoscopy was performed via one of the following access techniques [11]: i- Umbilical with veress needle. ii- Left upper quadrant (palmer's technique) with veress needle. iii- Umbilical with open technique (Hasson). iv- Direct trocar insertion of primary port.

Severity of the patients' postoperative shoulder and abdominal pain was evaluated at rest using the 10-point visual analogue scale (VAS) at 6 h and 24 hours after surgery [12]. The VAS consists of a non-graduated 10 cm line ranging from 0 for "no pain at all" to 10 for "Extreme pain". Patients were asked to give a score corresponding to their perceived pain. The postoperative analgesia was offered to all patients using one or two postoperative narcotic doses followed by two or three systemic non-steroidal doses.

Routine preoperative investigations, preparation and concentingwere offered for all patients that matches the hospital policy and procedure curriculum. All surgeries had been performed by laparoscopy team of gynecologists affiliated to the Obstetrics and Gynecology Department. All patients included in the study attended postoperative clinic over several weeks.

Ethical considerations

The study was approved by the organization and operating procedures of the research and study adminstratin- Directorate of health Affairs-Jeddah- Institutional review board (IRB) in compliance with the good clinical practice guidelines (approval IRB registration number (H-02-j-002).

Statistical analysis:

*Data were fed to the computer and analyzed using IBM SPSS software package version 20.0**.** **(**Armonk, NY: IBM Corp**).** Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation, median and interquartile range (IQR).*

Results:

By analyzing the patient characters and demographic data (Table I), the age indices (range 16-47, mean ± SD 31.83 ± 7.94, median 32) indicate that almost all of our patients are in the reproductive age group and hence, fertility potentials should be preserved and the incidence of malignant adnexal lesions was unlikely. Body mass index (BMI) showed that 54% (22 cases) of cases are either obese or overweight. From all the examined cases, only two were pregnant.

Operative findings and their percentages among the total number of cases showed that the most prevalent finding is ovarian cyst 39 cases (95%) followed by adnexal torsion 11 cases (26.83%). Only two cases diagnosed as adnexal lesions and found to be pseudocyst (table II).

A variety of data enrolled in this study was represented (table III). Pain is the most common presentation (65.9%). Dermoid cyst is the most prevalent pathological condition (36.6%). Fertility potentials and ovarian function are respected. Cystectomy was done for 29 (70.7%) cases, adnexal untwist done for seven cases (17.1%) and adnexectomy done for only seven cases (17.1%). The laparoscopic access technique used in most of cases is the classic umbilical veress needle (27 cases, 67.5%).The mean ± SD of operation time is (122 ± 68.15) minutes with a very wide range (50-440) minutes. Postoperative hospital stay is one day in the majority of cases with mean value ± SD (1.3±0.86) day.

The postoperative evaluation of pain in both the abdomen and the shoulder at rest, using the 10-point visual analogue scale (VAS) at 6 h and 24 hours after surgery was recorded (table IV).

Discussion:

Adnexal masses are commonly encountered in obstetric and gynecological practices, affecting women of all ages [1].The range of age in our study group was 16- to 47 years old with a mean of 31.83.That indicates that the incidence of benign adnexal masses is highest among women in reproductive age group[5]. Dermoid cyst is most common in 2nd and 3rd decades of life [13], hence it represents 36.6% (15 cases) of all studied cases.

Despite the fact that most of adnexal masses are detected incidentally during physical examination or imaging [6], acute or intermittent pain was the most common presenting symptom in our patients 65.9% (27cases).

Laparoscopy is essential for both completion and confirmation of diagnostic work up of adnexal masses [1]. Two cases out of 41 patients were misdiagnosed preoperatively as adnexal masses while they were found to be an encysted pelvic collection by laparoscopy (pseudocyst). If torsion adnexa is suspected, timely intervention with diagnostic laparoscopy is indicated to preserve ovarian functions and fertility potential [14]. In this study, seven cases out of 11 diagnosed as adnexal torsion were managed with laparoscopic detortion with or without cystectomy. Adnexectomy was performed for the four remaining cases due to extensive ovarian necrosis and/or fertility preservation was not desired by the patient.

Most of the cases with adnexal masses in this study were obese or overweight. That was indicated by high BMI with a mean of 26.65 ±6.46. Unlike the increased likelihood of laparotomies among obese patients noted by Thomas, D et al; (2006) [15], all the cases included in this study are performed uneventfully.

Only two mid-trimester pregnant cases were included in this study. Both patients' final diagnosis was mucinous cystadenomas with torsion adnexa in one of them. Both patients were operated

successfully by laparoscopic cystectomy. Several studies documented laparoscopy during pregnancy and concluded that it is the preferred approach in the second trimester when maternal-fetal risk deemed minimal. However, laparoscopy can be performed safely at any point during the pregnancy. Nevertheless, it may be impractical towards the later stages of pregnancy [16].

Whereas ovarian cysts > 8 cm in diameter are best managed by laparotomy, others have challenged for this notion [17, 18]. Three cases were involved in this study with big ovarian cysts exceeding 14 cm in diameter. One case was preceded by sonographic guided aspiration to reduce its size [17]. Open access "Hasson technique" was used for two of them and umbilical verses needle access for one case.

Spillage of cystic contents in the peritoneal cavity during laparoscopy is a common and a challenging event [17]. Dermoid cyst contents carry the risk of chemical peritonitis [19]. Mucinous cystadenoma rupture and fluid spillage increase the risk of recurrence and pseudomyxomaperitonei formation [20,21]. In our study, dermoid cysts (N=15) and mucinous cystadenomas (N=5) comprised nearly 50% of cases. Spillage cannot be completely avoided in most of the cases but its risk can be minimized by using copious fluid suction and irrigation and the use of laparoscopic retrieval bag device for collection and removal of cystic contents. In this study, no cases presented with any of the formerly mentioned complications.

Characteristics of the patients (age, BMI, history of other operations, parity and others) and operation characteristics (bilaterality of the lesion, adhesions, size and number of cysts) are variables contributing to the duration of the procedure [22]. Our mean ±SD operation time was 122.44 ±63.15 minutes with a median of 120 minutes are longer than reported in former studies by Gambadauro et al. (2015) [23] (mean= 75.14 minutes) and Shushan et al. (1999) [22] (mean= 72 minutes). The wide range (50 - 440 minutes) as well as the diversity of pathological types and the small number of our cases for each type, limit deeper statistical analysis to identify and explain the relevance of variables to the longer operation time indices. The non-surgical activities during the procedure were also contributing factors.

Laparoscopic entry techniques and technologies include the classic pneumoperitoneum with veress needle, the open (Hasson) technique, the direct trocar insertion, and visual entry system [24]. In addition to the classic technique in the periumbilical area, we used three access techniques for our cases respecting the evidence obtained from previous reviews. Open (Hasson) technique was used for large masses [25], left upper quadrant (Palmer's technique) access was performed for suspected adhesions or hernias in the periumbilical area and direct trocar entry was considered a safe alternative to veress needle access technique [24].

Apart from one case complicated by trocar site bleeding and controlled by Foley's catheter tamponade, no intraoperative complications were recorded in all the cases operated in this study. Postoperative drain was inserted in only 5 out of 41 cases. Postoperative drain insertion is preferred whenever there was massive spillage of cystic contents and after removal of large sized cysts [12]. Blood loss was minimal in all cases (less than 100 ml). Mean ±SD postoperative VAS scores were 2.1±1.2 after 6 hours and 0.7±0.6 after 24 hours for shoulder pain, and they were

4.2±2.3 after 6 hours and 2.5±2.1 after 24 hours for abdominal pain. Postoperative pain scoring was consistent with that found in other studies[12, 26, 27].The mean ±SD time for postoperative stay was 1.37±0.86 day and the median was 1 day that matches or even shorter than the results in other reviews [12, 27]. Neither early (within the first 24 hours after the procedure) nor late (after 24 hours) postoperative complications as fever, wound infection and bleeding were recorded during two months follow up in our outpatient clinic.

Conclusion:

Laparoscopic approach is the gold standard surgical approach for the management of benign adnexal masses. It is safe, feasible and reliable in terms of minimal intraoperative and postoperative complications, reduced postoperative pain and shorter hospital stay. It should be offered for patients who want to preserve their fertility potential. Pregnancy, size of adnexal mass, and risk of intraperitoneal adhesions are not limiting factors when performed by skilled team.

A conflict-of-interest statement:*There is no conflict of interest to disclose.*

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Table (I): Distribution of cases with benign adnexal masses according to patients' characteristics.

Patients' characteristics(n = 41)	***No. (%)***
Age (years)	
<30	*17 (41.5%)*
30 – 40	*18 (43.9%)*
>40	*6 (14.6%)*
Min. – Max.	*16.0 – 47.0*
Mean ± SD.	*31.83 ± 7.94*
Median (IQR)	*32.0 (27.0 – 37.0)*
Marital status	
Single	*12 (29.3%)*
Married	*28 (68.3%)*
Divorced	*1 (2.4%)*
BMI (kg/m^2)	
Normal	*19 (46.3%)*
Overweight	*11 (26.8%)*
Obese	*11 (26.8%)*
Min. – Max.	*32.0 – 47.80*

Mean ± SD.	*26.65 ± 6.46*
Median (IQR)	*25.20 (22.8 – 30.10)*
Current pregnancy	*2 (4.9%)*
Parity	***23 (56.1%)***
Min. – Max.	*1.0 – 6.0*
Mean ± SD.	*3.35 ± 1.64*
Median (IQR)	*3.0 (2.0 – 4.50)*
Abortions	***9 (22%)***
Min. – Max.	*1.0 – 4.0*
Mean ± SD.	*2.0 ± 0.87*
Median (IQR)	*2.0 (2.0 – 2.0)*
Vaginal deliveries	***15 (36.6%)***
Min. – Max.	*1.0 – 6.0*
Mean ± SD.	*3.13 ± 1.60*
Median (IQR)	*3.0 (2.0 – 4.0)*
Caesarian sections	***10 (24.4%)***
Min. – Max.	*1.0 – 5.0*
Mean ± SD.	*2.80 ± 1.62*
Median (IQR)	*2.50 (1.0 – 4.0)*
Nationality	
Non Saudi	*9 (22%)*
Saudi	*32 (78%)*
History of other laparotomy	*2 (4.9%)*

BMI: body mass index, Min: minimum, Max: maximum, SD: standard deviation, IQR: interquartile range

Table (II): Distribution of the studied cases according to operative findings (n = 41).

	No. (%)
Bilateral ovarian cyst	*2 (4.88%)*
Unilateral ovarian cyst	*37 (90.24%)*
Right	*26 (63.41%)*
Left	*11 (26.83%)*
Tortionadenexa	*11 (26.8%)*
Hemorrhagic cyst	*4 (9.8%)*
Hydrosalpinx	*1 (2.4%)*
Psudocyst	*2 (4.9%)*
Ruptured cyst	*1 (2.4%)*
Adhesion	*8 (19.5%)*
Gangrenous	*2 (4.9%)*

Table (III): Distribution of the studied cases according to different parameters. (n = 41)

	No. (%)
Presentation	
Accidental	*7 (17.1%)*
Pain	*27 (65.9%)*
Swelling	*5 (12.2%)*
Infertility	*6 (14.6%)*
Access technique	
Direct	*4 (9.8%)*
Open	*9 (22%)*
Conventional	*27 (67.5%)*
Palmer	*1 (2.4%)*
Histopathology	
Dermoid cyst	*15 (36.6%)*
Corpus leutium cyst	*4 (9.8%)*
Endometrioma	*1 (2.4%)*
Serous cystadenoma	*4 (9.8%)*
Mucinous cystadenoma	*5 (12.2%)*
Others	*11 (26.8%)*
Paraovarian cyst	*1 (2.4%)*
Intervention	
Cystectomy	*29 (70.7%)*
Adenexectomy	*7 (17.1%)*
Untwist	*7 (17.1%)*
Adhesolysis	*7 (17.1%)*
Others	*8 (19.5%)*
Drain	*5 (12.2%)*
Hospital stay (days)	
Min. – Max.	*1.0 – 5.0*
Mean ± SD.	*1.37 ± 0.86*
Median (IQR)	*1.0 (1.0 – 1.0)*
Operation time (minutes)	
Min. – Max.	*50.0 – 440.0*
Mean ± SD.	*122.44 ± 68.15*
Median (IQR)	*120.0 (90.0 – 130.0)*

Min: minimum, Max: maximum, SD: standard deviation, IQR: inter quartile range

(Table IV): Postoperative shoulder and abdominal pain scores according to the visual analogue scale (VAS) (n=41).

Postoperative pain (No=41)	*Mean ±SD*
6 hours	
Abdomen	*4.2±2.3*
Shoulder	*2.1±1.2*
24 hours	
Abdomen	*2.5±2.1*
Shoulder	*0.7±0.6*

SD: standard deviatio

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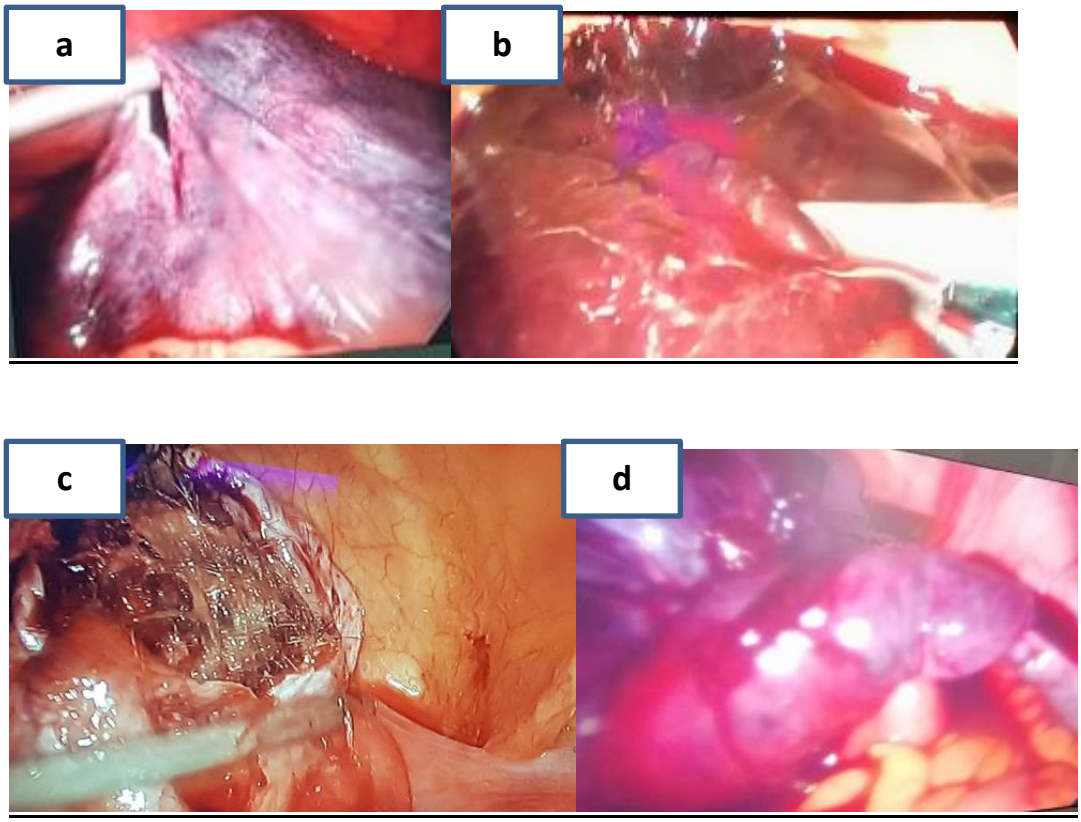
Figure 1



Legends of Figure

Figure 1: benginadenexal masses managed by laparscopy a- Cystectomy of huge ovarian cyst >10 cm b-Large paraovarian cyst c- Laparoscopic cystectomy of benign cystic teratoma d- Twisted larger ovarian cyst

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List of abbreviations:

CA: *Cancer antigen.*
HCG: *Human chorionic gonadotropin.*
CT: *Computed tomography.*
MRI: *Magnetic resonance imaging.*
VAS: *Visual analogue scale.*
BMI: *Body mass index.*
M features: *Malignant features*

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Intrauterine Device Knowledge and Practices among Obstetrics and Gynaecology Residents in Western Region of Saudi Arabia

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Abstract

Background:
There observed underuse of intrauterine device among Saudi women. This partly related to the information that women receive from their healthcare providers. Therefore, this survey aimed to evaluate the knowledge and counselling practices of obstetrics and gynaecology residents in the Western region of Saudi Arabia.
Methods:*This cross-sectional study conducted in several Saudi hospitals in western region throughout four months. Obstetrics and gynaecology residents across all five years of residency randomly selected to fill out a web-based questionnaire.*
Results*: Among 206 residents, 101 of them completed the questionnaire. Overall, respondents were least likely (4%) to correctly answer the question ''Mechanism of action of IUD'. Only 29.7% correctly responded with ''10 years'' as the answer for the question ''Maximum years of use for copper IUD'', and "Paragard (Copper T380A) IUD" as the answer for the question "Emergency contraception." Only 2.0% of respondents knew the prophylactic use of levonorgestrel IUD against endometrial hyperplasia and malignancy. Knowledge of the respondents about the routine use of IUD in patients that reported a history of deep vein thrombosis or pulmonary embolism was deficient (25.7%). Forty-two percentages of participants reported their usual recommendation of IUD to patients younger than 20 years old, immediately after delivery of the placenta, and to patients who have never been pregnant.*
Conclusion*: These findings explored a substantial lack of IUD knowledge and counselling practices among the participating residents. Also emphasises the need to develop our residency syllabuses. Additionally, provision of Ryan programs in the Saudi Obstetrics & Gynecology residency programs recommended..*
Keywords:*Obstetrics &gynaecology residents, intrauterine device, knowledge, counselling practices, survey, Saudi Arabia.*

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Introduction:

Intrauterine devices (IUDs) considered the most effective long-acting reversible contraceptives (LARCs) forms available, although their uptake has been slow (1). In the USA, unintended pregnancy increased nearly by half a rate that has increased recently contracted with a worldwide decline (2, 3). This fact is due to decrease adoption of using long-acting reversible contraception's (4).

Some studies showed that the total fertility rate of a population inversely related to the prevalence of contraception adoption rate (5). Despite that, IUD has higher user contentment and effect to decrease unplanned pregnancies and prevent abortions (4, 6). Also, to reduce the adoption, clinician misconception plays a significant contributor to underuse IUD (4).

For a proper decision making, All women should be counselled and informed regarding all different types of contraception in a way that permits them to do so(7). Obstetrics and gynaecology residency training programs they put all their efforts on women's health, that is why they are considered one of the most well taught about family planning, but their contraception practice exposure is different and is not standard over residency programs (8).

Another reason behind the underuse is the lake of the knowledge about IUD's (9). A study in the USA showed that 29% of clinicians stated that IUD's causes an increased risk of PID but most answered "strongly agreed" or "agreed" that IUD's was safe (98.5%) (10). Another study in the USA concluded that insufficient knowledge about IUD would influence the physician's ability to provide contraception care that will prevent an unplanned pregnancy (11). Therefore, our study aimed to assess the knowledge and practice of IUD use among obstetrics and gynaecology residents in the western region, Saudi Arabia.

Materials and methods:

A cross-sectional study conducted in several hospitals in the Western region of Saudi Arabia. The questionnaire distributed to residents in obstetrics and gynaecology across all five years of residency training to assess the knowledge and practice of IUD among them.

Participants randomly selected. Eligibility criteria included current enrolment in a Saudi residency program and agreed to participate in the study. All participants signed a consent explaining that participation was voluntary, and the data collected anonymously and kept confidentially

The valid questionnaire designed with Google forms and distributed to them by E-mail as a link with a description of the survey.

Permission was acquired to use the questionnaire from Tang et al.[12] The questionnaire contained eight multiple choice questions. Besides the demographic data, the questionnaire included 8 recall questions about prior IUD experience and family planning training, 20 questions to assess IUD knowledge, 13 clinical vignettes were constructed to assess practices for counselling candidates about the IUD, and 1 open-ended question asking ''What more do you wish that you knew about the IUD?''. The clinical practice vignettes represent a wide range of contraceptive counselling scenarios. The respondents asked to answer the 13 practices questions by choosing one of the following responses: ''recommend routinely'', ''recommend if other options are unacceptable'', ''never recommend'', or ''not sure.

The Institutional Review Board of King Abdulaziz University Medical College approved this study. The data were statistically analysed using descriptive statistics by Statistical Package for the Social Sciences (SPSS) v20. Categorical variables summarised as frequencies, percentages.

Results:

Among 206 resident at western region of Saudi Arabia, 101(49%) of them completed the entire survey, of which 64 (63.4%) were female. Residents from all five years of training completed the survey (Table 1). The majority (86.1%) planned to specialise. Almost half (47%) reported that they did not complete family planning rotation because they opted out of the rotation. Twelve per cent reported having a Ryan program in their residency. Moreover, 76 of the participants (75.4%) placed an IUD during their residency. Meanwhile, less than fourth (23.8%) of respondents had never placed a copper IUD during residency, whereas 24.8% had never placed a levonorgestrel IUD (Table 2). Six of the 21 chief resident respondents (28.6%) had placed e40 total IUDs. Twenty-five per cent of respondents had never attended a didactic lecture on the IUD, including 3 (14.3%) of chief resident respondents. The majority of the 20 knowledge questions, a higher proportion of residents in postgraduate years 4 and 5 responded with the correct answer in comparison with residents in postgraduate years 1, 2 and 3 (Table 3).

Overall, respondents were least likely (4%) to correctly answer the question ''Mechanism of action'', which may have resulted from a misunderstanding of the question. Only 29.7% correctly responded with ''10 years'' answering the question ''Maximum years of use for copper IUD'', and "Paragard (Copper T380A) IUD" as the answer for the question "Emergency contraception." Among the questions concerning the non-contraceptive benefits of the levonorgestrel IUD, only 2.0% responded they knew it could lead to ''Could offer protection from endometrial hyperplasia and cancer" and 2.0% ''Improvement of pain and bleed from

adenomyosis'', and 6.9% knew that it "Improvement of pain from endometriosis." For the 13 counselling practices questions, residents from postgraduate years 1 and 2 were, in general, more likely than residents in postgraduate years 3, 4 and 5 to ''recommend routinely.'' The IUD to patients in the vignettes (Table 4).

Respondents were least likely (25.7%) to ''recommend routinely'' patient with a history of DVT or pulmonary embolism. Even when the responses were expanded to include ''recommend if other options are unacceptable'', only 35.6% would ever recommend (data not shown). Forty-two per cent of respondents would routinely recommend the IUD to patients in the following categories: younger than 20 years old, postpartum (G48 h) after delivery of the placenta, and a patient who has never been pregnant. More than half 58.4% of respondents would ''recommend routinely'' the IUD to the patient who has had no deliveries.

Discussion:

It has been reported that Saudi women show the considerably low attitude towards IUD use for family planning throughout different regions of the kingdom (13, 5). One of the contributing factors to the observed underuse of IUD is the information that women receive from their providers about contraceptive methods (11). Therefore, this survey was the first to evaluate the level of knowledge and clinical skills acquired by residents practicing obstetrics and gynecology in the Western region of Saudi Arabia.

This study revealed a substantial lack of IUD knowledge and counselling practices among the participating residents. Remarkably, correct information about how IUD prevent the occurrence of pregnancy, the maximum years where copper IUD can be used, other known benefits of the hormonal IUD than birth control or the specific IUD type that can be used as an emergency contraceptive were significantly deficient. Additionally, senior contributors from the last three post-graduate years unexpectedly showed improper counselling practices. More than half of these residents did not routinely recommend the IUD to appropriate candidates, and they incorrectly restricted the IUD use in young nulliparous women, patients with a history of DVT or pulmonary embolism and immediately after delivery.

Saudi Obstetrics & Gynecology residency training programs dictate that trainee should know the advantages, disadvantages, statistical effectiveness, side effects and complications of contraceptive methods, and should learn to integrate the physician recommendations and the women's desires for proper contraceptive use. However, almost half (47%) of the study respondents reported that they did not complete their family planning rotation because they were opted out. Moreover, only a few residency programs as indicated by twelve per cent of the participants implemented a Ryan program. These educational and curricula defects might elucidate the detected deficiencies in the levels of the respondents.

In comparison with our findings, healthcare providers in various United States (US) universities also showed restricted prescription and placement of IUD in comparable categories of women including adolescents, nulliparous women and immediately after delivery or abortion and in the

presence of a history of sexually transmitted infections (14-16). Besides, Buhling et al. (17) surveyed health care providers in eight European countries and Canada, and they reported an apparent lack of knowledge and misconceptions particularly towards the use of IUD in nulliparous women.

A similar web-based survey recruited 699 obstetrics and gynecology residents from different residency programs in the US carried out (14). They concluded a comparable lack of knowledge and counselling practices among their respondents. However, our study detected a lower percentage of correct answers regarding the acceptable use of ''copper IUD'' for emergency contraception (29.7% compared to 53%). Moreover, our respondents were less likely to provide sound knowledge regarding other therapeutic uses of the hormonal IUD for pain and bleeding control in cases of endometriosis and adenomyosis and as a protection against endometrial hyperplasia and cancer. Furthermore, compared to the US residents, a higher percent of our senior residents did not recommend the routine use of IUD for many appropriate cases. These findings reflect greater defects in our resident's educational program. Only 75.4% of our respondents had placed IUD during their residency compared to 94% of their American counterparts. In addition, 25% of Saudi residents did not join the educational IUD lectures paralleled to only 12% of the American ones. All these might explain the missing of sound updated evidence-based knowledge and the improper counselling practices.

This study has the advantage of covering different regions in Saudi Arabia across several hospitals. Despite this, low response rate and small sample size considered a significant limitation. In addition, the random selection of the residents might convey unequal participation of experienced and inexperienced residents.

***In conclusion,** Saudi residents throughout the five years of obstetrics and gynecology residency showed significant deficiencies in their IUD knowledge and clinical practices. Therefore, this emphasizes the necessity to develop our syllabuses to provide sufficient IUD information and methods. Thereby, these physicians could provide proper counselling and do not act as barriers against IUD use. Therefore, the involvement of more evidence-based lectures about IUDs, and the endless searching for the updated guidelines on the best IUD practices could do this. Besides, we recommend more provision of family planning rotations and Ryan programs in the Saudi obstetrics and gynecology residency programs.*

Conflict of interest statement:

The authors report no disclosures or financial conflicts of interest or support.

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Table (1) Respondent characteristics and prior family planning experience:

Variable	***N***	***%***
Residency year		
1.00	*33*	*32.7*
2.00	*27*	*26.7*
3.00	*14*	*13.9*
4.00	*6*	*5.9*
5.00	*21*	*20.8*
Gender		
Male	*37*	*36.6*
Female	*64*	*63.4*
Planned subspecialty		
general OB/GYN	*14*	*13.9*
Urogynecology	*10*	*9.91*
Undecided	*12*	*11.9*
Gynecologic Oncology	*15*	*14.9*
Maternal-Fetal Medicine	*21*	*20.8*
Reproductive Endocrinology and Infertility	*23*	*22.8*
Minimally Invasive Gynecologic Surgery	*3*	*3.0*
Pediatric and Adolescent Gynecology	*2*	*2.0*
Other	*1*	*1.0*

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Table (2) Prior IUD experience by postgraduate year:

Variable		*1st year* *N* *%*	*2nd year* *N* *%*	*3rd year* *N* *%*	*4th year* *N* *%*	*5th year* *N* *%*	*Total* *N* *%*
No. copper IUDs placed during residency	*0*	*15* *45.5%*	*5* *18.5%*	*2* *14.3%*	*0* *0.0%*	*2* *9.5%*	*24* *23.8%*
	1-2	*15* *45.5%*	*9* *33.3%*	*3* *21.4%*	*0* *0.0%*	*2* *9.5%*	*29* *28.7%*
	3-5	*3* *9.1%*	*8* *29.6%*	*4* *28.6%*	*1* *16.7%*	*1* *4.8%*	*17* *16.8%*
	6-10	*0* *0.0%*	*2* *7.4%*	*2* *14.3%*	*0* *0.0%*	*3* *14.3%*	*7* *6.9%*
	11-20	*0* *0.0%*	*3* *11.1%*	*3* *21.4%*	*3* *50.0%*	*6* *28.6%*	*15* *14.9%*
	21-40	*0* *0.0%*	*0* *0.0%*	*0* *0.0%*	*0* *0.0%*	*1* *4.8%*	*1* *1.0%*
	>40	*0* *0.0%*	*0* *0.0%*	*0* *0.0%*	*2* *33.3%*	*6* *28.6%*	*8* *7.9%*
No. levonorgestrel IUDs placed during residency	*0*	*16* *48.5%*	*5* *18.5%*	*1* *7.1%*	*1* *16.7%*	*2* *9.5%*	*25* *24.8%*
	1-2	*15* *45.5%*	*13* *48.1%*	*2* *14.3%*	*0* *0.0%*	*1* *4.8%*	*31* *30.7%*
	3-5	*2* *6.1%*	*7* *25.9%*	*4* *28.6%*	*1* *16.7%*	*5* *23.8%*	*19* *18.8%*
	6-10	*0* *0.0%*	*2* *7.4%*	*3* *21.4%*	*1* *16.7%*	*5* *23.8%*	*11* *10.9%*
	11-20	*0* *0.0%*	*0* *0.0%*	*2* *14.3%*	*1* *16.7%*	*2* *9.5%*	*5* *5.0%*
	21-40	*0* *0.0%*	*0* *0.0%*	*2* *14.3%*	*0* *0.0%*	*2* *9.5%*	*4* *4.0%*
	>40	*0* *0.0%*	*0* *0.0%*	*0* *0.0%*	*2* *33.3%*	*4* *19.0%*	*6* *5.9%*
No. didactic lectures on IUD	*0*	*13* *39.4%*	*6* *22.2%*	*4* *28.6%*	*0* *0.0%*	*3* *14.3%*	*26* *25.7%*
	1	*15* *45.5%*	*8* *29.6%*	*2* *14.3%*	*0* *0.0%*	*4* *19.0%*	*29* *28.7%*
	2	*5* *15.2%*	*9* *33.3%*	*4* *28.6%*	*3* *50.0%*	*2* *9.5%*	*23* *22.8%*

	3	*0* *0.0%*	*4* *14.8%*	*4* *28.6%*	*0* *0.0%*	*7* *33.3%*	*15* *14.9%*
	≥ 4	*0* *0.0%*	*0* *0.0%*	*0* *0.0%*	*3* *50.0%*	*5* *23.8%*	*8* *7.9%*

Table (3) Number and percentage of correct answers for 20 knowledge questions by postgraduate year:

Variable	*1st year* *N* *%*	*2nd year* *N* *%*	*3rd year* *N* *%*	*4th year* *N* *%*	*5th year* *N* *%*	*Total* *N* *%*
1-year IUD failure rate	*13* *39.4%*	*17* *63.0%*	*7* *50.0%*	*6* *100.0%*	*17* *81.0%*	*60* *59.4%*
Maximum years of use for copper IUD	*2* *6.1%*	*9* *33.3%*	*6* *42.9%*	*5* *83.3%*	*8* *38.1%*	*30* *29.7%*
Maximum years for levonorgestrol IUD	*9* *27.3%*	*14* *51.9%*	*12* *85.7%*	*4* *66.7%*	*14* *66.7%*	*53* *52.5%*
Return to fertility	*20* *60.6%*	*17* *63.0%*	*6* *42.9%*	*2* *33.3%*	*18* *85.7%*	*63* *62.4%*
Discontinuation rate	*14* *42.4%*	*15* *55.6%*	*7* *50.0%*	*4* *66.7%*	*14* *66.7%*	*54* *53.5%*
Expulsion rate	*19* *57.6%*	*15* *55.6%*	*8* *57.1%*	*4* *66.7%*	*20* *95.2%*	*66* *65.3%*
Emergency contraception	*13* *39.4%*	*13* *48.1%*	*2* *14.3%*	*1* *16.7%*	*1* *4.8%*	*30* *29.7%*
Mechanism of action	*2* *6.1%*	*1* *3.7%*	*0* *0.0%*	*0* *0.0%*	*1* *4.8%*	*4* *4.0%*
Ectopic pregnancy risk	*11* *33.3%*	*12* *44.4%*	*3* *21.4%*	*5* *83.3%*	*13* *61.9%*	*44* *43.6%*
Pelvic inflammatory disease risk after 20 d	*19* *57.6%*	*18* *66.7%*	*8* *57.1%*	*3* *50.0%*	*15* *71.4%*	*63* *62.4%*
Antibiotic use before insertion	*6* *18.2%*	*9* *33.3%*	*7* *50.0%*	*6* *100.0%*	*19* *90.5%*	*47* *46.5%*
Cervical culture results before routine insertion	*3* *9.4%*	*9* *33.3%*	*3* *21.4%*	*4* *66.7%*	*13* *61.9%*	*32* *32.0%*
Wait until next menses before routine insertion	*3* *9.1%*	*8* *29.6%*	*5* *35.7%*	*3* *50.0%*	*12* *57.1%*	*31* *30.7%*
Improvement of bleeding from menorrhagia	*5* *15.2%*	*6* *22.2%*	*3* *21.4%*	*0* *0.0%*	*0* *0.0%*	*14* *13.9%*

Improvement of pain from endometriosis	*2 6.1%*	*2 7.4%*	*1 7.1%*	*1 16.7%*	*1 4.8%*	*7 6.9%*
Improvement of bleeding and pain from adenomyosis	*1 3.0%*	*1 3.7%*	*0 0.0%*	*0 0.0%*	*0 0.0%*	*2 2.0%*
No improvement of bulk symptoms from fibroids	*0 0.0%*	*1 3.7%*	*2 14.3%*	*0 0.0%*	*0 0.0%*	*3 3.0%*
No improvement of pain from ovarian cysts	*0 0.0%*	*2 7.4%*	*0 0.0%*	*0 0.0%*	*0 0.0%*	*2 2.0%*
Endometrial hyperplasia and cancer protection	*1 3.0%*	*0 0.0%*	*0 0.0%*	*0 0.0%*	*1 4.8%*	*2 2.0%*

Table (4) Number and percentage of correct answers for 13 counseling practices questions by postgraduate year:

Variable	*1st year*	*2nd year*	*3rd year*	*4th year*	*5th year*	*Total*
A patient who has never been pregnant	*11 33.3%*	*10 37.0%*	*8 57.1%*	*3 50.0%*	*14 66.7%*	*46 45.5%*
A patient who has had no deliveries	*14 42.4%*	*19 70.4%*	*9 64.3%*	*3 50.0%*	*14 66.7%*	*59 58.4%*
Patient who has had Q1 deliveries	*16 48.5%*	*14 51.9%*	*5 35.7%*	*0 0.0%*	*4 19.0%*	*39 38.6%*
Immediately after a first trimester abortion	*15 45.5%*	*11 40.7%*	*7 50.0%*	*2 33.3%*	*5 23.8%*	*40 39.6%*
Immediately postpartum (G48 h) after delivery of placenta	*19 57.6%*	*11 40.7%*	*6 42.9%*	*3 50.0%*	*4 19.0%*	*43 42.6%*
A patient G20 years old	*19 57.6%*	*10 37.0%*	*5 35.7%*	*1 16.7%*	*6 28.6%*	*41 40.6%*

A patient who has 1 sexual partner	*14* *42.4%*	*9* *33.3%*	*8* *57.1%*	*1* *16.7%*	*5* *23.8%*	*37* *36.6%*
A patient who has 91 sexual partner	*15* *45.5%*	*13* *48.1%*	*7* *50.0%*	*4* *66.7%*	*2* *9.5%*	*41* *40.6%*
Patient with history of ectopic pregnancy	*13* *39.4%*	*10* *37.0%*	*5* *35.7%*	*2* *33.3%*	*10* *47.6%*	*40* *39.6%*
Patient with history of STI that has been treated	*13* *39.4%*	*9* *33.3%*	*5* *35.7%*	*1* *16.7%*	*8* *38.1%*	*36* *35.6%*
Patient with history of PID 93 mo ago	*12* *36.4%*	*8* *29.6%*	*4* *28.6%*	*1* *16.7%*	*7* *33.3%*	*32* *31.7%*
Patient with HIV that is well controlled on antiretrovirals	*5* *15.2%*	*4* *14.8%*	*0* *0.0%*	*1* *16.7%*	*8* *38.1%*	*18* *17.8%*
Patient with a history of DVT or pulmonary embolism	*10* *30.3%*	*8* *29.6%*	*3* *21.4%*	*1* *16.7%*	*4* *19.0%*	*26* *25.7%*

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Measure Incidence of 3rd and 4th degree perineal tear among pregnant ladies in King Abdulaziz Medical City, Jeddah - delivering vaginally and assisted vaginal deliveries

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Abstract

Objective:*The aim of the present study is to assess the incidence of 3rd and 4th perineal tear among patient who deliver vaginally or with assisted vaginal delivery in King Abdulaziz Medical City (KAMC) Jeddah.*

Methods:
Settings: *A population based retrospective cohort study conducted all deliveries with 3rd and 4th vaginal tear analyzed from January 2016- January 2019 in King Abdulaziz Medical City, Jeddah. The hospital has around 3400 deliveries per year.*
Subjects: *There was a total of 10,517 deliveries from January 2016 until January 2019. A total of 3,357 (31.9%) Cesarean sections delivery were excluded from the study.*

Results*:*

Parity: *It has a great impact of having a 3rd and 4thperineal tear in about 113 cases were nulliparous. Total of 78.2% of women had sever perineal tear were nulliparous.*

Instrumental delivery: *In our study ventouse delivery account for 40% of all delivery with 3rd and 4th degree perineal tear. Whereas forceps delivery account for 2.1 %.*

Episiotomy: *After reviewing the data, total number of patients who had episiotomy from january 2016 until january 2019 were 1059 cases about 45 cases had sever perineal tears (4.2 %).*

Position: *In our study about 52.77 % are undetermined position ,36.8% are occipitoanterior position and 9% are occipitoposterior, as observed undetermined vertex position is high.*

Anesthesia and suturing: *Patients who had local anesthesia were 51.7 %, epidural 35.2 %, spinal 6.9 %. About 86.9 % of cases were suture in labor and delivery room. 12.4 % of cases were suture in operating room*

Conclusion*: Result from our study showed that instrumental delivery and nulliparity are major risk factors for having sever perineal tears.*

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Keywords:*perineal tear, instrumental delivery, third tear, furth tear, Saudi Arabia*

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Introduction:

Obstetrical care frequently faces dilemmas in the management of the second stage of labor. The decision to whether or not a particular birth assistance needed depending on the urgency of the case, experience and skills of the obstetrician and the timing of any intervention. Therefore, the decision must take in consideration the risks and the potential problems within the skills of the operator. Obstetricians should be confident and competent in the use of assisted vaginal delivery equipments i.e. ventouse and forceps (1).
Almost 10% of vaginal delivery in the western countries end up by ventouse or forceps delivery. With observation for the last few years the use of ventouse as assisted vaginal delivery was more than forceps worldwide. The reason of increase the usage of ventouse is the new design of vacuum cup with reduce risk of injury to the fetus and increase instrumental success rate. As instrumental assisted vaginal deliveries increase the risk of perineal laceration all four types. This is why obstetricians should know what are the difference between these types (2).
The four types of perineal laceration include:
First-degree tear: laceration is limited to the fourchetteand superficial perineal skin or vaginal mucosa.
Second-degree tear: laceration extends beyond fourchette, perineal skin and vaginal mucosa to perineal muscles and fascia, but not the anal sphincter.
Third-degree tear: fourchette, perineal skin, vaginal mucosa, muscles, and anal sphincter are torn; third-degree tears may be further subdivided into three types.
3a: partial tear of the external anal sphincter involving less than 50% thickness.
3b: greater than 50% tear of the external anal sphincter.
3c: internal sphincter is torn.
Fourth-degree tear: fourchette, perineal skin, vaginal mucosa, muscles, anal sphincter, and rectal mucosa are torn (3,4).

The incidence of obstetric anal sphincter injuries (OASIS) (in singleton, term, cephalic, vaginal birth) in England has tripled from 1.8% to 5.9% between 2000 to 2012.The overall incidence in the UK is 2.9% (range 0–8%), with an incidence of 6.1% in primipara compared with 1.7% in multipara (5).

A study was done in our region published in April 2018 in Security Forces Hospital, Riyadh, Saudi Arabia. It studied the rate of 3rd and 4th degree perineal tear and it's related risk factors in single Saudi center. A retrospective observational cohort study was done. The study concluded that risk factors for severe perineal tears: gestational age >40 weeks, nulliparity, moderate/ severe obesity, instrumental delivery, shoulder dystocia, active second stage more than 90 min, birth weight more than 4 kg, head circumference at birth more than 34 cm and length at birth of more than 50 cm. Risk factors still significant with obesity (OR=2.8, CI=1.3-6.1), instrumental delivery (OR=2.6, CI=1.2-5.6) and birth weight (OR=1.1/hg, CI=1.1-1.2). However, no incidence was mentioned in the results (1).

The aim of the present study is to assess the incidence of 3rdand 4th perineal tear among patient who deliver vaginally or with assisted vaginal delivery in King Abdulaziz Medical City (KAMC) Jeddah.

Materials and methods

Settings: *A population based retrospective cohort study conducted all deliveries with 3rd and 4th vaginal tear analyzed from January 2016- January 2019 in King Abdulaziz Medical City, Jeddah. The hospital has around 3400 deliveries per year. Data were extracted from data base software for antenatal care through Hospital System and from labor and delivery records. Patients who deliver vaginally (spontaneous and instrumental) and had 3rdand 4th degree perineal tear were included in the study.*
Subjects: *There was a total of 10,517 deliveries from January 2016 until January 2019. A total of 3,357 (31.9%) Cesarean sections delivery were excluded from the study.*
Inclusion criteria: *Patients between 18-45 years, with a singleton baby who deliver vaginally, with/without episiotomy, and with a singleton cephalic baby regardless the weight.*
Exclusion criteria: *All patient who didn't meet our criteria were excluded. A total of 10,517 deliveries, 144 of these deliveries had 3rd,4thperineal tears.*

Results

Parity: *Nulliparity is a one of the most important risk factor as shown in our results. It has a great impact of having a 3rd and 4thperineal tear about 113 cases were nulliparous. Total of 78.2% of women had sever perineal tear were nulliparous.*

Instrumental delivery: *As known instrumental delivery is a major risk factor of having 3rd and 4thperineal tear. In our study ventouse delivery account for 40% of all delivery with 3rd and 4th degree perineal tear. Where as forceps delivery account for 2.1 % of all deliveries with 3rd and 4thperineal tear. As shown in the table we have low number of instrumental deliveries but still with significant incidence of 3rd and 4thperineal tear.*

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		Frequency	Percent
Type Delivery	VAGINAL	84	57.9
	VENTOUSE	58	40.0
	FORCEPS	3	2.1
	Total	145	100.0

Table 1: *The percent and frequencies of patients who develop 3rd and 4th degree tear in crosstab with the type of delivery they underwent with.*

Episiotomy: *There is controversial evidence thatEpisiotomy can be a protective measures to prevent 3rd and 4th degree tears. After reviewing the data , total number of patient who had episiotomy from january 2016 until january 2019 were 1059 cases about 45 cases had sever perineal tears (4.2 %). In total cases who had sever perineal tears during this time as shown in table 2 were 114 , 68.3% of patients without episiotomy and 31% of patients had episiotomy (table 2).*

		Frequency	Percent	Total episiotomy during this time
Episiotomy	NO	99	68.3	6031
	YES	45	31.0	1059
	Total	144	99.3	7090

Table 2: *The percent and frequencies of the patients who earn a tear with and without episiotomy.*

Position: *It is a mandatory pre-requisite to determine position of the fetal head before applying an instrument. In our study about 52.77 % are undetermined position ,36.8% are occipitoanterior position and 9% are occipitoposterior. as observed undetermined vertex position is high.*

		Type of Delivery			
		VAGINAL	VENTOUSE	FORCEPS	Total
Position	OA	14	38	1	53
	OP	4	8	1	13
	OT	2	0	0	2
	UD	64	11	1	76
Total		84	57	3	144

Table 3: *this table shows the frequencies of fetus head position and type of delivery*

Anesthesia and suturing: *Evaluation and suturing of 3rd and 4th degree tear should be done under proper anesthesia and in proper sitting like operating room as recommended.*

patients who had local anesthesia were 51.7 %, epidural 35.2 %, spinal 6.9 %.
About 86.9 % of cases were suture in labor and delivery room. 12.4 % of cases were suture in operating room.

Discussion:

Age: *The mean age of having a 3rd and 4thperineal tear is 26 year old (12.4%).*

Nulliparity: *Nulliparous are the women who never go into labor with pregnancy above the gestational age of 20 weeks or the fetal weight below 500 g.*
The results showed nulliparous women has higher incidence of getting 3rd and 4th degree tear, in percent of 78.2% out of the total patients, nulliparous have the majority of the tears in total number of 113. Within the nulliparous, 55 patients develop 3A degree of tear, while 41 patients develop 3B degree (Table 4). As the nulliparous never had perinealdistention which means the tissue never undergo stretching that makes it more born for tearing. The progress of the nulliparous women is slower than the multiparous women, therefore; the perineal tissue is more exposure to ischemia because of the prolong head completion (12). Therefore, tissue after getting ischemia, the tissue would be weak to handle the pressure that coursed by the baby head and easily torn.

		Degree of Tear				
		3A	3B	3C	4.0	Total
Parity	P0	55	41	15	2	113
	P1	14	4	4	0	22
	P2	4	1	1	0	6
	P3	1	1	0	0	2
	4	0	1	0	0	1
Total		74	48	20	2	144

Table 4: *A descriptive table of the total patients who had degree of tears. In specific, this table show each parity group in crosstab with the degree of tear.*

Instrumental delivery*: one of the well-known risk factor of 3rd and 4th degree tear worldwide (11) . As reported by nationwide inpatient sample third degree laceration rate of 3.3 % and fourth degree laceration rate of 1.1%(13).*

A meta-analysis of data of 22 studies showed women who had severe lacerations, the strongest risk factors include forceps delivery (OR 5.50%, CI 3.17-9.55), ventouse delivery (OR 3.98,CI 2.60-6.09), mid line episiotomy (OR 3.82,1.96-7.42) and increase fetal birth weight (mean difference 192.88g, 95% CI 139.80-245.96) (4)). As per our labor and delivery recordsrate of ventuse delivery between year jan 2016-jan 2019 is 564 about 58 of those patient had severed perineal tear with the rate of (10.28%).

		Frequency	Percent	Total Delivery During This Time	Tearing Percent
Delivery Type	VAGINAL	84	57.9	6483	1.29
	VENTOUSE	58	40.0	564	10.29
	FORCEPS	3	2.1	43	6.98
	Total	145	100.0	100.0	

Table 4: the total delivery types from January 2016 to January 2019 and the percent of tearing within each delivery type.

Instrumental delivery should mimic normal delivery so the anatomy of the perineum and the shape of the birth canal should be in consideration. Any deviation from normal process can lead to complications (5). Universal prerequisites to do instrumental delivery should be followed:

As mentioned in the table below most of the deliveries are by residents (R3) total of 36 cases with percent of 24.8% and board certified residents (BCP) total of 41 cases with present of 28.3% (Table 5).

		Frequency	Percent	Cumulative Percent
Operator	R1	21	14.5	14.5
	R2	11	7.6	22.1
	R3	36	24.8	46.9
	R4	11	7.6	54.5
	R5	10	6.9	61.4
	BCP	41	28.3	89.7
	CONSULTANT	15	10.3	100.0
	Total	145	100.0	

Table 5: a descriptive table show the number of cases that develop sever perineal tear and what is the *level of the physician conducting the delivery.*

Determining the position of the head is required before applying assisted vaginal deliveries instruments. In our study about 38 cases are occipitoanterior position (OA), 8 cases occipitoposterior (OP) and 11 cases undetermined. AS recommended knowing the position is mandatory to help in which direction instrument should be moved while pulling. In case it was difficult for a junior to defined the position help can be asked from senior expert.

Episiotomy: *Routine episiotomy with instrumental delivery is not the practice any more. There are no data to support the use of routine episiotomy with operative vaginal delivery. Routine episiotomy with operative vaginal delivery is not recommended because poor healing and prolonged discomfort has been reported with mediolateral episiotomy (7).*
Several studies compare the different type of episiotomy (eithermidolateral and midline episiotomy) . As several retrospective studies have found an association between midline episiotomy and anal sphincter trauma with operative vaginal delivery (14).
Mediolateral episiotomy has lower risk of developing sever perineal tears with instrumental delivery (9).
After reviewing our records episiotomy was not done routinely, only for indicated cases. Total of 68.8% of patient who had 3rd and 4th degree perineal tear did not had episiotomy, 64.91% of ventouse delivery episiotomy was not done and 35.1% had episiotomy. In forceps delivery about 33.3% episiotomy was not done, 66.7% of forceps deliveries episiotomy was performed (Figure 1).

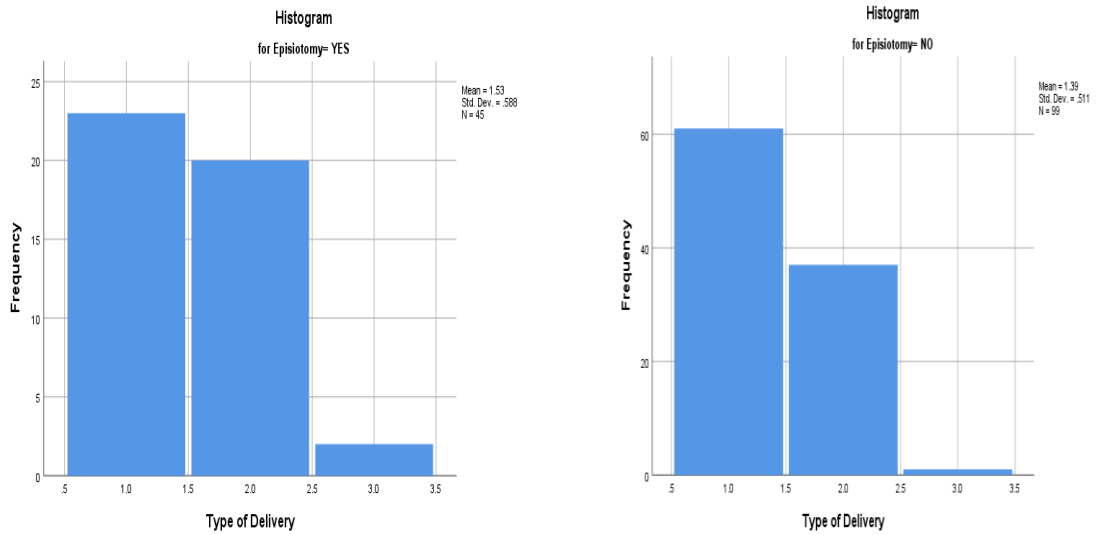

Figure 1: *illustrated the frequencies of tears among the patients who got episiotomy and the whom not got. The columns show Vaginal, Ventouse, and Forceps, respectively.*
Fetal weight: *fetal weight is a considerable risk factor of having sever perineal tear with instrumental deliveries. As was found by our study the greater risk of having tears was with fetal weight ranging from 3-3999 G. about 101 cases (with percentage of 70.1%) develop perinealtears, 33 cases with fetal weight of 2500-2999 G (with percentage of 22.9%) (Table 6). The higher the baby weight the more the injury to perineum because while delivering the fetus*

the perineal tissue will be over stretched and it will be more prone to torn especially if delivery was. Quick especially if fetal weight Is greater than 4 KG.
A study was done to compare fetal weight with degree of vaginal laceration. infants who had birth weights greater than 4,000 g and those who had birth weights between 3,000 g and 3,999 g. Infants with birth weights greater than 4,000 g had an overall injury rate of 1.6% compared with 0.4% in the lower birth weight group. (10)

30.		Frequency	Percent	Frequency of Fetal Weight During This Time	Fetal Weight Percent with Tear
Fetal Weight	<1000g	0	0	124	0
	1000g-1499g	0	0	128	0
	1500g-1999g	0	0	248	0
	2000g-2499g	7	4.9	969	0.7
	2500g-2999g	33	22.9	3192	1.0
	3000g-3999g	101	70.1	5803	1.7
	>4000g	3	2.1	214	1.4
	Total	144	100.0	10678	

Table 6: *the total fetal weight from January 2016 to January 2019 and the percent of tearing within each weight.*

In order to reduce such complication with fetal weight of 3kg and above protective measure can be done such mediolateral episiotomy at time of crowening. Good Perineal support to be done, eg. Left hand slowing down the delivery of the head, Rrght hand protecting the perineum., Mother slow pushing when head is crowning.
Conclusion:

In conclusion, as 3rd and 4th degree tear have a significant impaction on patients' quality of life, patient who develop such tears were evaluated in order to identified which risk factors is mostly causing 3rd and 4thperineal tears in our population. Our study showed that instrumental delivery and nulliparity are major risk factors for having sever perineal tears.

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Attitudes and Behavior of Pregnant Omani Women towards Gestational Weight Gain and Exercise during Pregnancy: A survey study.

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Abstract

Objective:*The purpose of this study was to evaluate the attitude of pregnant Omani women toward their current weight, healthy weight gain and exercise during pregnancy. And to investigate their views on what they might consider as helpful resources to prevent excessive gestational weight gain.*

Methods:*A cross sectional study was conducted in Sultan Qaboos University Hospital (SQUH) between October and December 2016. One hundred and eighty pregnant Omani women between 19 to 45 years of age were recruited. A questionnaire was used to collect the data. Statistical analysis using Pearson's chi-square test was conducted to evaluate the association between the study variables and Body Mass Index (BMI) group.*

Results*: The prevalence of obesity among the study sample was 37%. Out of the obese group, 58% felt uncomfortable about their weight (P value <0.05). Most pregnant Omani women stopped exercising when they got pregnant. Only 34% of women in this sample exercised during pregnancy. Significant associations were found between the concern about potential weight gain and BMI group (P value =0.05). Fourteen percent of the women gained excessive weight but did not lose it after delivering previous babies and majority of them were classified as obese (p value <0.05). Feeling tired and lack of time were the main reasons reported for not exercising during pregnancy.*

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Conclusion*: The results suggest that attitude of pregnant Omani women is reasonable toward weight gain and exercise during pregnancy. However, only few of them exercised during pregnancy, which highlights the fact that practicing physical activities were inadequate.*

Keywords: *Omani women, Pregnancy, Attitude, Exercise, Excessive gestational weight gain, weight, BMI, body mass index.*

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Introduction

Pregnancy is a critical period in life during which rapid weight gain is likely to occur (1). Excessive gestational weight is the most common factor for high-risk pregnancy outcomes and it is prevalent worldwide. Maternal obesity is significantly associated with increasing age, parity, black ethnic group and deprivation (2). It causes short- and long-term complications for both neonate and mother. Furthermore, obesity makes it difficult for obstetricians and midwives to practice their jobs (3). Potential errors and technical difficulties could occur in the diagnosis and visualization of fetus anomalies in the prenatal ultrasound scan (4).

Maternal obesity in associated with increase in the risk of gestational diabetes, preeclampsia, postpartum hemorrhage, macrosomia and miscarriage. A high risk of both elective and emergency cesarean section is frequently observed in very obese women compared with women of normal weight (5, 6). In addition, postpartum infections are more prevalent among obese women and is directly associated with operative delivery (5). Furthermore, childhood obesity is another consequence of maternal obesity due to lactation failure seen in obese women. Therefore, they are less likely to maintain breastfeeding for long durations, which results in formula feeding (7).

The Institute of Medicine (IOM) encourages women to follow healthy diets and increase their physical activity during pregnancy. Guidelines are proposed by the IOM for the proper gaining of gestational weight. Regarding pre-pregnancy Body Mass Index (BMI), it is recommended that women with low BMI (<19.8) gain 12.7-18 kg, 11.5-16 kg for those with normal BMI (19.8-26.0), 7-11.5 kg for overweight women with (BMI >26.0 - 29.0) and 5.0-9.1kg for obese (BMI>30.0) (1).

With regards to exercise during pregnancy, exercise has many benefits for the mother and her fetus and carries minimal or no risks. Women who exercise are found to have stronger muscles and less likely to develop gestational hypertension compared to inactive women. They have easier deliveries, fewer cesarean sections and recover faster postpartum (8). Physical activities like walking, swimming and biking have been considered as safe if practiced moderately (9). However, some exercises like scuba diving carries risks of fetal malformation and gas embolism induced by decompression (10). The American College of Obstetricians and Gynecologists (ACOG) published recommendations and contraindications for practicing exercise during pregnancy. All women with uncomplicated pregnancy are encouraged to exercise. However,

high-risk activities such as those at high altitudes or activities that may cause falling or abdominal trauma should be avoided (11).

The guidance of health care givers influences the behaviors of pregnant women and it can alter their weights (12). In a case-control study that examined the efficacy of intervention on the gestational weight gain based on socioeconomic state, it was found that 52% of low-income women who did not receive advice gained more than recommended weight. However, 33% of those who got the advice gained excessive weight. Nevertheless, there was no significant difference between cases and controls among the high-income group (13). Moreover, dietary and lifestyle interventions are found to be the most effective in the reduction of maternal weight gain and it is associated with improvements in the pregnancy outcomes (14). Whereas, there are many barriers that clinicians may face in providing primary care to obese pregnant women and preventing the excessive weight gain. Some of which are due to constricted time for counseling and lack of professional training (15).

Objective

The aim of this study was to evaluate the attitude of pregnant Omani women toward their current weight in relation to their BMI, healthy weight gain and exercise during pregnancy. It aims to determine the percentage of women who have regular exercise before pregnancy and during pregnancy and to investigate their views on the available resources that encourage healthy lifestyle and exercise during pregnancy. The outcomes of this study will able to assist in developing national programmes and improve the facilities that are provided by health care workers, community and the government. Moreover, adapting to these measures will result in improvement in women's health leading to better maternal and fetal outcome.

Methodology

A descriptive cross sectional study was conducted in the department of Obstetrics and Gynecology (OBGYN) in The Sultan Qaboos University Hospital (SQUH) between October and December 2016. Consent was obtained from 180 pregnant Omani women and they were asked to participate by filling a questionnaire entitled "Attitudes and Behavior of Pregnant Omani Women toward Gestational Weight Gain and Exercise during Pregnancy ".

The research ethics committee at the College of Medicine and Health Sciences in Sultan Qaboos University approved the study. The questionnaire requested information on the women's age, weight, height, education, occupation, stage of pregnancy, and family income, exercise during pregnancy and barriers to exercising during pregnancy. Women who were unable to give informed consentwere excluded. All participants provided written informed consent. They were aged between 19 – 45 years at any trimester during their pregnancy and were literate.

A pilot study was done which included 10 completed questionnaires to determine any errors that may indicate difficulties with any aspect in the questions and modifications were done accordingly.

The Statistical Package for Social Science (SPSS version 22) was used for the purpose of data analysis. Responses were reported descriptively and Chi square test was used to test associationbetween variables and differences in response according to BMI group. The continuous variables (age, weight, height, gestational age ...etc) were analyzed by obtaining the mean and the standard deviation.

Results

The sociodemographic and obstetric characteristics of 180 pregnant Omani women is displayed in table 1. The mean age of the participants was 31 years old and the standard deviation was ± 5.1. The youngest participant was 19 and the oldest age was 45 years old. The mean gestational age was 27 weeks. About sixty two percent were in the third trimester of pregnancy. Majority of the women (79.8%) had previous pregnancies. None of the women in this study were illiterate and 52.2% reported having university education. Forty Four per cent (44.4%) were employed and the average monthly family income was between 1000-2000 Rials for most of the participants.

The set of questions was designed to review the knowledge and perception of the respondents regarding exercise during pregnancy and their participation in regular exercises. There were a total of 180 women in this study. Information on height and/or weight was not recorded in 22 individuals (12.2%), so the BMI was not calculated for this group. The remainder 158 women were divided into two categories according to their BMI (classified into obese and non-obese). More than half (51.1%, n=92) of the women were non-obese with BMI less than 30, and 36.7% (n=66) of the study group were obese with BMI more than or equal to 30, the remainder with missing data.

Majority of the women (64%) who did not feel comfortable with their weight were from the obese group (p value < 0.05). Figure 2 illustrates the view of pregnant women on their current weight. Interestingly, 28% of those who agreed with the statement of being comfortable with their weight were obese.

When asked about their views on potential weight gain in the current pregnancy, twenty individuals of the study population (11.1%) expressed their worries about gaining excessive weight. However, 49 out of 180 women (27%) were not concerned about gaining weight and the majority of those were noted in the non-obese group (p value <0.05). About 6% of the women in this study gained a lot of weight and did not lose it after delivery of previous babies and almost all of these women were obese (p value <0.05). Table 2 illustrates the opinions on current weight and potential gestational weight gain.

Women were also askedwhether they practice physical exercise before and during pregnancy. The majority of women (66.1%) used to practice physical exercise before pregnancy and the relationship between exercising before pregnancy and BMI group was significant (p value = 0.001). Almost 54% of non-obese and 82% of the obese group exercised prior to pregnancy. However, only 33.9% of the participants continued to exercise during the pregnancy with similar findings of 32.2% and 33.3% in the non-obese and obese groups respectively (P=1.00).

Almost all of those who exercise during pregnancy preferred walking (98.2%). Swimming ranked second with 8.2%, and aerobics with 4.9%. Other forms of exercise were mentioned by two respondents, which were volleyball and skipping (3.3%).

The women were also asked about the barriers that prevented them from practicing during pregnancy. The major barriers to exercising reported by women were lack of time (32%) and the feeling of tiredness (41%). However 18% believed that exercise is harmful to the fetus. Four per cent of the participant who did not exercise during pregnancy was due to history of recurrent miscarriages and back pain.

Responses regarding resources did not differ by BMI. All of the resources suggested in the questionnaire such as advice from medical practitioners were considered by most of the respondents as helpful. Eighty seven percent (87.2%) agreed that attending a clinic to get targeted advice would help in preventing excessive gestational weight gain.

With regards to access to sport and practicing physical activity in preventing excessive gestational weight gain also showed high agreement (64%). However, 30% were unsure about it.

Healthy meals cooking were viewed as helpful to the majority (86.7%) and other resources such as Internet and mobile phone application advices as well as leaflets on healthy eating were also considered to be beneficial by more than half of the women.

Discussion

The findings from this study showed that pregnant Omani women have a reasonable attitude and behavior towards exercise during pregnancy. However, only few of them reported that they exercise during pregnancy, which highlights the fact that practice was not adequate.

In this study, some of the women did not have any concerns about gaining excessive weight in the current pregnancy. Around half of the women expected to gain some weight during pregnancy but they did not wish for it to be excessive. Whilst, others reported that they were very worried about gaining excessive weight during pregnancy. There was a significant difference between the responses of obese compared with non-obese women about their concerns (p value =0.05). We found obese women to be more uncomfortable with their current weight than non-obese women. Prior study carried amongst a diverse sample of women in New York showed that many of them were concerned about gaining weight and how their bodies will look after delivery (16). Another

similar study was conducted in the United Kingdom showed similar opinions compared to our study. Around 60% of the women had concerns, but 40 % did not express any concerns including those who had not lost weight gained from previous pregnancies (17). However, our findings were inconsistent with Weir et al.'s study which revealed that women usually matter less about their weight during pregnancy but, get motivated to lose it after delivery assuming that breastfeeding would help them to return to pre-pregnancy weight (18). This may be attributed to lack of information given to pregnant women about the importance of maintaining healthy weight during pregnancy.

Postpartum weight retention is greatly associated with gestational weight gain (19). About 6% of pregnant Omani women viewed they gained a lot of weight and did not lose it after having baby and this was significantly associated with their BMI (P value = 0.004). Obese women appeared to have a tendency to retain gestational weight after delivery more so than non-obese women. In contrast, 17% gained excessive weight and lost it after delivery, this finding was not significantly related to the BMI groups. Leslie, et al. showed that 9% of their study population retained weight after pregnancy (17). However, weight gain issues should be considered with great care.

With regards to exercise in this study, there is an agreement with many other studies conducted in different countries showing that few women exercise during pregnancy (20, 21). The association between practice of exercise before pregnancy and the BMI was statistically significant (P value = 0.001). In both groups, exercise before pregnancy was more than that during pregnancy. Almost half of the obese women stopped exercising during pregnancy as the percentage decreased from 82% to 33%. Our findings were consistent with Ribeiro and Milanez results (21), where 29% of the women had exercised or were exercising during pregnancy with the vast majority of them practiced walking. Although women are aware of benefits, they believe that rest and relaxation during pregnancy is more important than regular exercise in maintaining healthy lifestyle (22). In a study conducted in the United States, women were interviewed to assess their knowledge about obesity related risks during pregnancy. They showed greater knowledge about excessive gestational weight was associated with lower participant weight (23). This highlights the importance of educating the population about the benefits of exercise for pregnant women. Additionally, providing instruction about different types of appropriate exercise and avoiding unsafe practices during pregnancy increases compliance. Furthermore, encouraging individuals who previously exercise to continue practicing after delivery.

Obesity in Oman has increased markedly in the past few years. In 2000, the prevalence of overweight and obesity combined has reached 51% of the Omani population (24).
Exercise is viewed as a key component for healthy pregnancy in women of all weight ranges. In this study, the main reasons for not exercising were tiredness followed by lack of time, which are common barriers that were also found in similar studies (20, 21). In Duncombe, et al study, "being too busy" was the first reason for not exercising and "tiredness" was the second (20). Non-exercise related signs and symptoms were reported mostly in the later stage of pregnancy such as body soreness, leg cramps, shortness of breath, gastrointestinal upset. These were seen

as barriers to exercise by women in that same study. Therefore, as pregnancy progresses, women tend to decrease the duration and intensity of exercise during pregnancy (20, 22, 25). In addition, working women exercised less, mainly because they are too busy or not getting time off work (17). So, further studies are needed to help women overcome these common barriers.

Previous studies showed inadequate advice given by health care providers on physical activity and lack of communication between women and their midwives (18, 26). Advice and intervention by doctors on excessive gestational weight gain is an effective action to decrease postpartum weight retention (13). Majority of women in our study (87.2%) agreed that attending a clinic to get targeted advice would benefit and help in preventing excessive gestational weight gain. However, the results were different in a similar study, where only 14% of the study population thought that attending a clinic for individualized advice would be helpful (17). In a randomized controlled trial that studied the effect of lifestyle intervention on gestational weight gain, improvement in some dietary habits were beneficial. The total body fat was reduced in all women to the recommended level with increase in calcium, fruit and vegetable intake (27). Thus, the capabilities of midwives in advice and intervention should not be underestimated.

In general, during pregnancy women focus on healthy eating and seek for nutrition information more than physical activity (18, 28). In our study, majority of the women (86.7%) agreed that cooking healthy meals would help them in preventing excessive gestational weight gain. However, a striking number were unsure about the benefits of exercise and physical activity in maintaining healthy weights during pregnancy. Research is required to develop effective interventions that address physical exercise alongside nutrition including the specific dietary requirements of pregnancy.

A cross sectional study in the United Kingdom to explore pregnant women's sources of information regarding physical exercise, revealed that 96% of the study population received advice at least once during the pregnancy from different sources such as books, magazines, family or health professionals. However, none of them increased their activity during pregnancy. In that same study, most women relied on written sources to get advice (22). From our research, 86% of women agreed that reading leaflets advice on healthy eating during pregnancy would help them prevent excessive gestational weight gain and 24% unsure whether the online websites or mobile phone application would be beneficial.

Limitations

Data from this study was from a small sample population of 180 pregnant Omani ladies. It was conducted in only one tertiary health center in Oman. A larger sample of pregnant women is needed from all regions in Oman to ascertain our findings. The majority of the participants were college or university educated. Therefore, a more diverse sample is required. Moreover, self reported heights and weights is another drawback in this study.
Despite the limitations, our findings can help health care professionals realize the importance of interventions to provide the appropriate management.

Conclusion

To conclude, pregnant Omani women's exercise performance during pregnancy was inadequate although all of them were educated women. This is likely due to lack of information given by the health practitioners.National programs about physical exercise during pregnancy and national guidelines for healthy gestational weight gain are needed in Oman. Further research is required to evaluate their knowledge of the recommended pregnancy weight gain range.

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Appendix:

Table 1: Characteristics of women participating in the study (N = 180)

Characteristic	Frequency	Valid Percentage (%)
Age		
<25	20	11.2%
25-29	55	30.9%
30-35	64	36.0%
36-40	34	19.1%
>40	5	2.8%
Number of pregnancies		
None	36	20.2%
1	38	21.3%
2	34	19.1%
3	21	11.8%
More than 3	49	27.5%
Stage of pregnancy		
First trimester	22	12.4%
Second trimester	44	24.9%
Third trimester	111	62.7%
Educational level		
Illiterate	0	0%
School	61	35.9%
University	94	55.3%
Post-university	15	8.8%
Occupation		
Employed	93	51.7%
Not employed	80	44.4%
Average family income (Rials)		
<1000	63	39.1%

1000-2000	75	46.6%
>2000	23	14.3%

Table 2: Opinions on current weight and potential gestational weight gain

	Non-obese (BMI<30) n=92	Obese (BMI>30) n=66	P value
Views on potential weight gain in current pregnancy			
Not concerned.	34 (38.6%)	15 (22.7%)	0.055
Expect to gain some weight.	45(51.5%)	37 (56.1%)	0.658
Really worried about gaining a lot of weight.	8 (9.1%)	12 (18.2%)	0.157
Other.	1 (1.1%)	2 (3%)	
Opinions concerning weight gain in previous pregnancies			
Acceptable weight gain and returned to pre-pregnancy weight.	40 (44%)	19 (28.8%)	0.077
Acceptable weight gain but did not lose again after having baby.	11(12.1%)	16 (24.2%)	0.075
Gained a lot of weight but lost it after having baby.	14 (16.5%)	13 (19.7%)	0.758
Gained a lot of weight but did not lose it after having baby.	1 (1.1%)	9 (13.6%)	0.004
No previous pregnancies	24 (26.4%)	9 (13.6%)	

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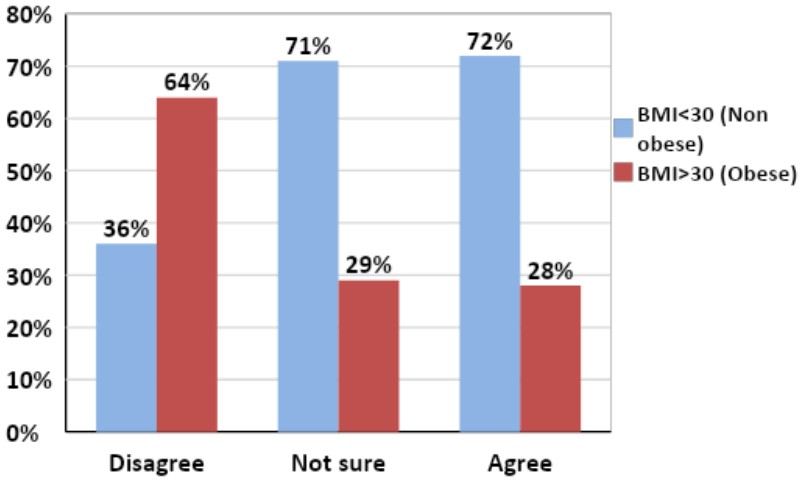
Figure 2: Responses to "You are feeling comfortable with your weight at the moment"



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Knowledge, attitudes, and practices of family planning and contraceptive methods among woman of reproductive age in Jeddah, Saudi Arabia - 2020 - a cross-sectional study

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Abstract

Background:
Family planning is a regulation of pregnancy spacing by using contraceptive methods. It plays an enormous role in enhancing women's and children's health as well as controlling the population's growth. What is not yet clear is the degree of understanding and usage of family planning methods among females. Therefore, this study aims to assess the level of knowledge, attitudes, and practices of family planning and contraceptive methods among the females of reproductive age in Jeddah, Saudi Arabia.
Methods:
This study is a descriptive, cross-sectional study using pre-designated questionnaire among women of reproductive age who live in Jeddah, Saudi Arabia, from July to September 2020. The sample was randomly selected, and those who met the inclusion criteria asked to fill a questionnaire survey. The data was collected then analyzed with SPSS.
Results*:*
The total responses 689, The mean age of our sample was 34.8 (± 9.04), and most of them were in the age group 21-25 (21%). Furthermore, 67.6% had a moderate level of knowledge about contraceptive methods. A good majority of the participants (69.6%) had agreed that contraceptives protected the family and the community's health.
Conclusion*:*
This study found a strong relationship that demonstrates the impact of awareness and knowledge on attitude, practice of family planning, and contraceptive methods for limiting the offspring's number and spacing pregnancies. Also, it highlights the need for woman's education programs. The results of the study will help physicians promote family planning services in Jeddah.
Keywords:
Family planning, Contraception, Reproductive age, Saudi Arabia.

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Introduction:

Family planning (FP) is the couple's settlement about the desired number of offspring and the regulation of pregnancy spacing by using various contraceptive methods. 1 It plays a significant role in improving women's and children's health as well as controlling the growth of the population. 2,3 FP acts as a critical factor in avoiding social, financial, and health consequences resulting from unnational pregnancies 4; besides, it prevents abortions and sexual disease transmission. 5

There are several ways to classify the methods of family planning; the classical method is divided into withdrawal and rhythm and contraceptive utilization. The newer methods are divided into three classes: short-term contraceptive methods (oral pills, injectable, male and female condoms, foam tablet, and cervical cap) and long-acting reversible contraceptive methods (intrauterine contraceptive device and Implants), irreversible surgical methods (tubal ligation for females and vasectomy for male). 6 In Saudi Arabia (SA), the most common contraceptives used are oral and intrauterine contraceptives. 7–9

Multiple factors contribute to the utilization of contraceptive methods in SA, such as maternal age, the number of children, educational level, economic status, and family size. 10–13 In the past few years, a marked increase in the usage of contraception in developing countries resulted in a 40% reduction of maternal mortality, which then contributed to reduced percentages of unintended pregnancies. 14 According to the World Health Organization (WHO) list, there are various reasons for people to lack the motivation in FP, such as a shortage in numbers of facilities to contraceptive methods, lack of awareness about the possible side effects by depending mostly on the limited viewpoint of the society, and the provider bias that is linked to decreasing the quality of provided education about the subject's aspects. 15In SA, the birth rate in 2020 is 17.097 births per 1000 people, compared to 2019, the birth rate in 2020 has declined by 2.65%. 16

A cross-sectional study conducted in Suva, Fiji showed that almost half of the participants had a right level of knowledge; half had a high level of attitude, and almost ten percent had a high level of practice towards family planning. 1

Another, a cross-sectional study that was conducted in southeast India, showed 75% of contraception awareness. The correct practice was only reported in 34% of the population due to lack of knowledge, male baby desire and, a husband's pressure. 17 Moreover, a cross-sectional study was done in Ethiopia showed that all the participants had heard at least about one type of contraceptive based mainly on health workers; however, about 36.1% believe contraceptives are harmful while 39.8 % conceive the use of contraceptives cause infertility. 18

Lastly, in 2020 a cross-sectional study was done in SA that concluded that 32.2% of participants had used contraceptives while 45% are currently using contraceptives, and about 22.8% non-users on the other hand. 10

To date, there are a limited number of studies that took place in Jeddah, and there is a gap in the knowledge of contraception utilization. 19 Previous studies published in Saudi Arabia didn't investigate women's attitudes and practices with different types of contraceptive methods 20,21, which is the focus of our study. Therefore, this paper aims to identify the level of knowledge, attitude and practices of family planning and contraceptives method among females of reproductive age in Jeddah, SA

Methodology:

A descriptive cross-sectional study was conducted randomly in Jeddah, Saudi Arabia, for a period from July 2020 to September 2020. This study was approved by Dr. SolimanFakeeh Hospital Scientific Research Review Committee (DSFH IRB). A total number of 1088 responses were received. After the exclusion, only 689 were included, for this study, the target population was females in their reproductive age, excluding all non-married females and females older than 55 years old individuals the sample was selected from different regions in Jeddah, Saudi Arabia, to answer the questionnaire. The study questionnaire was adapted from a validated survey that was previously used in Suva, Fiji. 1 The survey was translated into Arabic and subjected to a process of forward and backward translation. All participants acquired written, informed consent to join this study. All the information in this study was confidential, and only authorized personal had access to the subject's data. The survey was legally permitted and socially accepted. The pre-tested questionnaire consisted of four sections:

Section 1: Socio-demographic profile

Section 2: Knowledge-based section with 12 questions, the participant had an option to answer (Yes/No and I do not know). For coding the incorrect answer, which is (No) = (0), the correct answer, which is (Yes) = (2). An answer with (I do not know) = (1) and total points to be scored = 24 and the minimum score = 0. The correct answers were quantified as 0-11 as poor knowledge, 12-18 as moderate knowledge, and 19-24 as good knowledge.

Section 3: Attitude assessment based on a Likert Scale scoring system consisting of 15 questions
Section 4: Results of the participant's family planning practices.

Data entry was performed by using Microsoft Excel 2019 and processed by Statistical Package for the Social Sciences (SPSS) software, version 21 (IBN, Armonk, NY, USA). Mean, and the standard deviation was calculated to describe continuous variables, while frequencies were used for categorical variables. A Chi-square test was used to identify the differences and associations between categorical variables. One way ANOVA was used to identify the differences and associations between continuous variables. An alpha level less than 0.05 was considered statistically significant.

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Results:

This paper aims to determine the level of knowledge, attitude, and practices of family planning and contraceptive methods among females of reproductive age in Jeddah, Saudi Arabia. Initially, a total of 1088 responses were received; from different regions in Jeddah, and only 689 (63%) were validly included. The mean age of our sample was 34.8 (± 9.04), and most of them were in the age group 21-25 (21%). The majority of subjects are Saudi, 586 (85.1%), with around (56.2%;387) of the participants are from the north part of the city. More than half of the participants were non employed (60.5%;417). Moreover, a large proportion of the participants had a bachelor's degree or above (81.3%;560). Four hundred forty-three (64.3%) of the participants have between zero to three children (Table 1).

The vast majority of participants (98.3 %) have heard of certain forms of contraceptives in their life. Only (15.5 %;107) of the participants were aware that birth control pills are ineffective if a woman avoided taking them in a row for two or three days.

Over one third (37.3%) were unaware that (the only way to prevent pregnancy is female sterilization (tying fallopian tubes). In contrast, a large percentage of the participants (98.5%) agreed that health education was important for women who want to utilize contraception. A large number of participants (75.5%;520), agreed that contraceptive pills did not provide 100% protection, as well as (58.3%;402) were aware that condoms prevent Sexually Transmitted Infections (STIs).

Also, most of the participants (90.9 %) had previous knowledge that contraceptive pills caused side effects of mood swings and weight gain. Around one third (37.6%; 259) of participants who used contraceptive oral estrogen-containing pills knew about the increased risk of breast cancer.

Surprisingly (59.2%;408) of participants do not know that using the pill increases the risk of ovarian, endometrial, or cervical cancer. Likewise, a large number of the participants (66.6%;459), did not know that an intramuscular injection Depo Provera contraceptive shot must are administered on a three-monthly basis. A good majority of the participants (75.8%;522), are knowledgeable about the possibility of changing the contraception method in case of experiencing undesirable side effects. More than two-thirds (72.7%;501), did know that combined methods (both a condom and a contraceptive pill) are considered very successful contraception (Table 2). According to the knowledge score, two-thirds of the participants had moderate knowledge (67.6%;466), almost a third had good knowledge, 217(31.5%), and only six (0.9%) had poor knowledge.

There was no statistically significant relationship (P=0.135) between the categorical knowledge score of the participants and the number of visits to a health center for family planning services.

The Likert Scale scoring system consists only of responses of "Agree or Strongly Agree," which are combined to show the total percentage to each question of the participants' answers that are displayed in table 3. Around two-thirds of the participants (70.1%;483) agreed/strongly agreed

that contraceptives should be used to limit a woman's number of children. Likewise, a large majority of the participants (89.6%;617) agreed/ strongly agreed that contraceptive use was necessary to control the time interval between the childbirths. A majority of the participants (74.2%;511) agreed/strongly agreed that spacing allows for healthier children. More than three quarters (83.6%;576) agreed/strongly agreed that the ideal age of a woman's childbearing age is 20-30. Around seventy percent (67.3%;464) of the participants agreed/strongly agreed that the ideal number of children is between 3 and 5. A majority of the participants (77.8%;536) agreed/strongly agreed that contraceptives provided a sense of safety. For participants on contraceptives(72.3%;498) agreed/strongly agreed that the type of contraceptive method they were using was adequate.

Roughly, half of the participants(56.1%;387) agreed/strongly agreed that contraceptives benefited males. On the other hand, only a minority, 56 (8.1%), of the participants thought that discussion of contraceptives with their spouses was embarrassing. Furthermore, a small fraction of the participants, 70 (10.2%), mentioned that their spouse disapproved of their use of contraceptives. A predominant number of participants (69.6%;479) believed that contraceptives protected the family and the community's health. Religion played a minor role in a woman's decision to use contraceptive in only one-third of the participants (28.4%;196), in contrast to the cultural beliefs(40.1%;276). A good number of the participants felt that the husband's objections had influenced their spouse's decision to use contraceptives (65%;448). Also, the one-way ANOVA revealed a significant relationship between the number of children and the husband disapproving of the use of contraception (p =0.001). There was a significant relationship (P-value=0.006) between the parity and the adequate type of contraceptive method they were using.

Regarding family planning consultation in medical centers, the results showed that around one-third of the participants have never consulted a healthcare provider (38.5%; 265). More than half of the participants always use contraception to prevent unplanned pregnancy (55%;385). While (59.1%; 407) of the participants always use contraception to prevent pregnancy, only a small fraction (10%;70) of participants have unintended pregnancies due to lack of contraception. A minority of participants (16.3%;112) use different contraception methods, and (12.9%;89) of participants change their contraception from time to time. Almost one-third of the participants (31.6%;218) practice the traditional methods (Table 4). Chi-square test showed a significant relationship between unplanned pregnancy and adequacy of methods with (0.001) p-value. There was a significant relationship between the number of visits to health centers for family planning services and their level of knowledge that contraceptive methods maintain family and community health (p=0.001).

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Table 1: Demographic profile of the participants

Variable	*Frequency*	*Percentage*
Age	*less than 21(5)*	*0.7*
	21-25 (145)	*21*
	26-30 (115)	*16.7*
	31-35 (110)	*16*
	36-40 (121)	*17.6*
	41-45(97)	*14.1*
	46-50(73)	*10.6*
	51-55(23)	*3.3*
Nationality	*Saudi (586)*	*85.1*
	Non-Saudi (103)	*14.9*
Region	*North (387)*	*56.2*
	West (57)	*8.3*
	East (106)	*15.4*
	South (139)	*20.2*
Marital status	*Married (650)*	*94.3*
	Divorced (35)	*5.1*

	Widow (4)	*.6*
	Employer (272)	*39.5*

Employment status	*Non-employer (417)*	*60.5*
Educational level	*Bachelor's or above (560)*	*81.3*
	high school (115)	*16.7*
	secondary school(9)	*1.3*
	primary school degree(1)	*.1*
	Illiterate (4)	*.6*
Number of children	*0-3 (443)*	*64.3*
	4-7 (228)	*33.1*
	8-10 (18)	*2.6*

Table 2: Frequency of responses on knowledge-related questions.

Questions (n=689)	*Responses*	*N*	*%*
1. Have you ever heard of contraceptives	*Yes*	*677*	*98.3*
	No	*9*	*1.3*

	I don't know	*3*	*0.4*
	Yes	*107*	*15.5*

2. Birth control pills are effective even if a woman misses taking them for two or three days in a row.	*No*	*401*	*58.2*
	I don't know	*181*	*26.3*
3. Female sterilization is one way to avoid pregnancy.	*Yes*	*194*	*28.2*
	No	*257*	*37.3*
	I don't know	*238*	*34.5*
4. Health education is important for women who want to use contraception.	*Yes*	*679*	*98.5*
	No	*3*	*0.4*
	I don't know	*7*	*1.0*
5. Contraceptive pills do not guarantee 100% protection.	*Yes*	*520*	*75.5*
	No	*118*	*17.1*
	I don't know	*51*	*7.4*
6. Condoms prevent STIs.	*Yes*	*402*	*58.3*
	No	*107*	*15.5*

	I don't know	*180*	*26.1*
7. Common side effects of contraceptive pills include mood swings and weight gain.	*Yes*	*626*	*90.9*
	No	*16*	*2.3*
	I don't know	*47*	*6.8*
	Yes	*259*	*37.6*

8. There is an increased risk of breast cancer in women taking estrogen-containing contraceptives.	*No*	*79*	*11.5*
	I don't know	*351*	*50.9*
9. Women using the birth control shot (Depo Provera) must get an injection every three months.	*Yes*	*211*	*30.6*
	No	*19*	*2.8*
	I don't know	*459*	*66.6*
10. If a woman is having side effects of one kind of contraceptive pill, switching to another type might help.	*Yes*	*522*	*75.8*
	No	*32*	*4.6*

	I don't know	*135*	*19.6*
11. Using both a condom and the pill is considered to be a very effective contraceptive.	*Yes*	*501*	*72.7*
	No	*53*	*7.7*
	I don't know	*135*	*19.6*
12. Using the pill increases a woman's risk of ovarian, endometrial, or cervical cancer.	*Yes*	*155*	*22.5*
	No	*126*	*18.3*
	I don't know	*408*	*59.2*

Table 3: Frequency of responses on attitudes-related questions.

Attitudes (n=689)	*Strongly Agree*	*Agree*		*Neutral*		*Disagree*		*Strongly Disagree*		*Total*
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*N (%)*
1. Contraceptives should be used to limit my number of children.	*229*	*33.2*	*254*	*36.9*	*119*	*17.3*	*69*	*10.0*	*18*	*2.6*	*483 (70.1)*
2. Contraceptives should be used to increase the	*334*	*48.5*	*283*	*41.1*	*55*	*8.0*	*15*	*2.2*	*2*	*0.3*	*617 (89.6)*

time interval between my childbirths.											
3. Spacing will allow a child to be healthier.	*294*	*42.7*	*217*	*31.5*	*127*	*18.4*	*45*	*6.5*	*6*	*0.9*	*511 (74.2)*
4. The ideal age of having a first child is 20- 30.	*329*	*47.8*	*247*	*35.8*	*79*	*11.5*	*32*	*4.6*	*2*	*0.3*	*576 (83.6)*
5. The ideal number of children should be between 3-5.	*229*	*33.2*	*235*	*34.1*	*146*	*21.2*	*63*	*9.1*	*16*	*2.3*	*464 (67.3)*
6. Contraceptives provide a sense of safety.	*225*	*32.7*	*311*	*45.1*	*83*	*12.0*	*63*	*9.1*	*7*	*1.0*	*536 (77.8)*
7. The method of contraception I am using is adequate.	*206*	*29.9*	*292*	*42.4*	*143*	*20.8*	*40*	*5.8*	*8*	*1.2*	*498 (72.3)*
8. Contraceptives benefit males too.	*109*	*15.8*	*278*	*40.3*	*180*	*26.1*	*103*	*14.9*	*19*	*2.8*	*387 (56.1)*
9. Discussion about contraception with a spouse is embarrassing.	*23*	*3.3*	*33*	*4.8*	*39*	*5.7*	*310*	*45.0*	*284*	*41.2*	*56 (8.1)*
10. My husband does not approve my use of contraceptives.	*20*	*2.9*	*50*	*7.3*	*117*	*17.0*	*269*	*39.0*	*233*	*33.8*	*70 (10.2)*

11. Contraceptive methods can protect the health of family and community.	*185*	*26.9*	*294*	*42.7*	*146*	*21.2*	*52*	*7.5*	*12*	*1.7*	*479 (69.6)*

12. Religious beliefs can prevent women from using contraceptives.	*62*	*9.0*	*134*	*19.4*	*176*	*25.5*	*233*	*33.8*	*84*	*12.2*	*196 (28.4)*
13. Cultural beliefs can prevent women from using contraceptives.	*59*	*8.6*	*217*	*31.5*	*143*	*20.8*	*197*	*28.6*	*73*	*10.6*	*276 (40.1)*
14. Husband's objections to contraceptives can prevent women from using contraceptives.	*96*	*13.9*	*352*	*51.1*	*106*	*15.4*	*106*	*15.4*	*29*	*4.2*	*448 (65)*
15. Change in male attitudes on contraceptives may improve contraceptive use.	*166*	*24.1*	*332*	*48.2*	*131*	*19.0*	*56*	*8.1*	*4*	*0.6*	*498 (72.3)*

Table 4: Frequency of responses on practice-related questions.

Practices questions (n=689)	*Always*		*Usually*		*Sometimes*		*Seldom*		*Never*		*Total*
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N (%)*
1- How many times a year do you visit a	*43*	*0.062*	*75*	*0.109*	*132*	*0.192*	*174*	*0.253*	*265*	*0.385*	*689 (100%)*

health center for family planning services?											
2- Do you use contraceptives to prevent unplanned pregnancy?	*385*	*0.559*	*129*	*18.7*	*62*	*0.09*	*34*	*0.049*	*79*	*0.115*	*689 (100%)*
3- Have you ever had any unplanned pregnancy due to lack of contraceptive use?	*70*	*0.102*	*71*	*0.103*	*144*	*0.209*	*131*	*0.19*	*273*	*0.396*	*689 (100%)*
4- Do you use contraceptives every time when you do not intend to get pregnancy?	*407*	*0.591*	*96*	*0.139*	*63*	*0.091*	*35*	*0.051*	*88*	*0.128*	*689 (100%)*
5- I use different types of contraceptives	*112*	*16.3 ٪*	*77*	*11.2 ٪*	*125*	*18.1 ٪*	*145*	*0.21*	*230*	*0.334*	*689 (100%)*
6- My current method of contraceptive changes from time to time	*89*	*12.9 ٪*	*118*	*17.1 ٪*	*125*	*18.1 ٪*	*126*	*18.3 ٪*	*231*	*33.5 ٪*	*689 (100%)*
7- Do you practice any traditional contraceptive methods?	*218*	*31.6 ٪*	*84*	*12.2 ٪*	*115*	*16.7 ٪*	*76*	*11 ٪*	*196*	*28.4 ٪*	*689 (100%)*

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Discussion:

In this study, we aimed to address and identify the current level of knowledge, attitudes, and practices of family planning and contraceptive methods among the females of reproductive age in Jeddah, Saudi Arabia.

The results have stated that 98.3% of the participants have heard of contraception at one point in their life. However, 67.6% had a moderate level of knowledge about the contraception methods, as several previous studies in Saudi Arabia have shown.[12,22–26]
Most participants had adequate levels of knowledge; for instance, a large majority were sufficiently aware that missing contraceptive pills for more than 2-3 days in a row would result in pregnancy. Moreover, they were knowledgeable about using condoms to prevent STDs as well as the common side effects of contraceptive pills, such as mood swings and weight gain. [20,27]

The importance of knowing the source of information was highlighted in a study that conducted previously in SA in 2019 showed that (58.5%, n=3022) of females depends on the Internet as the primary source, followed by healthcare physicians (45.1%). At the same time, a lesser fraction of the participants get their information from their partners (10%) and social media (17%).[27]
However, the results of this study show that the level of knowledge is not reflective of the number of visits to a health center for family planning services, and 98.5% show an interest in the importance of contraceptive education. Additionally, health care providers do not do theirexpected role in improving family planning awareness, and the family was the fundamental wellspring of information (51.8%).[22,27]
Also, a study was conducted in AlJouf, a region on the Northern side of Saudi Arabia, reported that the most common contraceptive methods used in Saudi Arabia were oral contraceptive pills (71.2%) and intrauterine contraceptives (23.5%).[10,20,24,28] *There is still considerable room for physicians to make further progress in determining the appropriate approaches to educating women about contraception. Regarding female sterilization, there is a lack of awareness as one-third of (37.3%) of our sample are unaware of female sterilization. This result was consistent with another study that was held in Abha, a city in the southern region in Saudi Arabia by Al-Musa HM et al. Showed that (77.0%) of there population was unaware of female sterilization.*[22] *All these finding points toward the importance of the physician's role in increasing the knowledge of all kinds of contraceptive*

methods as the awareness did not show an improvement. Similar results were reported in a study done in 1988 in Riyadh that reported knowledge about female sterilization accounted for only 0.9%.[29]

Saudi society is often religious and conservative. The results appear compatible with this approach, as it demonstrates a clear inverse relationship between the holding of strict religious views and the use of contraceptives. Furthermore, there is a high incidence of legalized polygamy in Saudi society, and men are proud to have more children in this culture, prompting women to have more children to sustain their marital relationship, an obstacle to contraceptive use in this population.[30] *Therefore, the study finds a significant relationship between the number of children and the husband's disapproval of the use of contraceptives, that affects the woman's decision, health as well as community and children's health in general as the results have shown a statistically significant relationship between religion and using contraceptives to aim a limited number of children. The current study participant reported that having 3-5 children as the ideal number (34.1%).*
In contrast, a study done in Al-Qassim, a city in the central region in Saudi Arabia, by Al Sheeha M showed that most of their participants preferred to have 5 to 10 children (70.0%), and nearly one fourth (23.3 %) to have more than ten children, while only 4.8 % of women desired less than five children.[12] *Also, Al-musa HM et al. reported that 45.5% of the participants preferred 4 to 5 number of children.*[22]*This difference in the desired number of children is attributable to the various cultural beliefs between the regions in Saudi Arabia.*

During the last years, the Saudi community experienced rapid changes in the socioeconomic pattern that has major effects on the improvements in women's education and employment, which played a significant role in changing fertility beliefs and behaviors.[10] *Therefore, the results showed a vast majority of the participants 74.2% had a positive opinion of the effect of spacing between pregnancies on the family, and it allows for healthier children, which indicates more tendencies to birth spacing with different contraceptive methods. On top of that, Al-musa HM et al. stated that the majority, 45.9% preferred interval of the pregnancy spacing to be 2–3 year* [22]*, and reported that spacing was significantly higher in younger age as compared to older age groups, which had a higher need for limiters ($p < 0.001$).*[31]

This study shows that more than three quarters (83.6%) strongly agreed/agreed that the ideal age of a woman's childbearing age is 20-30. According to a study that was done in Jeddah in 2016, showed the differences

in utilization of contraceptives that it was evident that the majority (80.4%) of the females in the age group (34-44) had used contraceptives if compared to only (38.2%) of the females aged less than 25 years whoever used contraceptives.[20] These reported variations in the percentages of females who used contraceptives according to their age groups were statistically significant $p<0.05$, which could be clarified by the fact that females at this age group are mainly newly married and willing to get pregnant.[20]

In other aspects, a small fraction of people still rely on traditional methods as a way to prevent pregnancy. Al Sheeha M reported that 10.7% depending on the use of traditional contraceptive methods regularly, which divided into the three traditional methods mostly practiced were rhythm 4.0%, withdrawal 3.6%, and breastfeeding by 3.1%.[12] This study states that a higher number, almost one-third of the participants (31.6%), practice the traditional methods. The present study, as other studies, had several limitations; it is a cross-sectional study design that has a recall-bias, and the majority of the participants live in the northern region in Jeddah. For that reason, we do not have a variety in distribution, and the survey was not spread to rural areas in Jeddah. Also, the knowledge, attitude, and practice were only evaluated for one of the couples, and there was not a comparison between males and females. Also, most of the included participants were highly educated, which don't represent the whole population.

Conclusion:

According to the previously mentioned result, we observed a strong relationship that demonstrates the impact of awareness and knowledge on attitude, the practice of family planning, and contraceptive methods for limiting the offspring's number and spacing pregnancies, which contributes to the health of the children, mothers, and community. Religions, cultural beliefs, and husband's disapproval are defining factors that impact the use of contraception use negatively. As for the practices associated with family planning in Jeddah, the lack of depth in awareness for the need for regular visits to the health centers for family planning services was found. Therefore, the physicians should raise awareness about this subject more frequently with female patients who could benefit from considering this choice. Moreover, since this study evaluated only the females, a study similar to this one should be carried out on including the males to compare as well as to promote healthy birth spacing by enforcing programs for family planning education.

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Conflicts of Interest:

The authors declare no conflict of interest.

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Vasa Previa with short uterine cervix : A case report

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Abstract

Background
Diagnosis of Vasa Previa and short cervix is a rare gynecological condition, and it can occur even without any placental malposition. Ultrasonography is one of the most useful and accessible devices for detecting this condition and to confirm such diagnosis.

Case Presentation
A 31years old G3P0 woman presented with short cervical length at 20th week of gestation. Vasa previa measuring 14 cm was diagnosed at 22nd week of gestation. At the 30th week, she delivered a baby girl weighing 1440grams.Both mother and child are well and healthy.

Conclusion*: Timely detection of vasa previa decreases the chances of neonatal mortality. There is need for setting up proper guidelines at the national level for raising awareness about the complications and prompt diagnosis of vasa previaspecially of associated with other obstetrical complications.*

Keywords:*Vasa previa, Fetal distress, cervical length, risk factors, complications, systematic review*

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Background:

Vasa Previa is a medical condition in which the blood vessels remain unprotected by the umbilical tissue present within the membranes while passing from fetus to placenta running close to the internal OS (Datta, Babu, Mitra, &Patil, 2016). Vasa Previa being a rare complication is often missed at the routine ultrasound examination putting the fetus at risk of fetal distress and hemorrhage due to vessel rupture(Kulkarni et al., 2018). The estimated prevalence of vasa previa 0.6% per 1000 deliveries(Ruiter et al., 2016) undetected vasa previa followed by vaginal delivery decreases the fetal chances of survival to less than 50% (Villani, Pavalagantharajah, & D'Souza, 2020)(Pavalagantharajah, Villani, & D'Souza, 2020). The succenturiate/bilobate placenta, umbilical cord'svelamentous insertion, placenta previa, multiple pregnancies, and the post in vitro fertilization gestations are all risk factors for vasa previa(Sinkey, Odibo, &Dashe, 2015). If short cervical length is depicted on sonography along with vasa previa then it calls for the emergency delivery of the fetus(Maymon et al., 2018). We present a unique case of vasa previa along with a short cervix that is successfully delivered at our hospital.

Case Presentation

A 31year oldgravida 3 para 0 presented to the hospital for a routine antenatal checkup. She was diagnosed with a cervical length of 1.9cm at the 20th week of gestation. Patient was referred to the Fetal Assessment Unit , cervical length found to be 1.5cm on the second measurement. Patient counseled about the findings and given instructions when to present to hospital.

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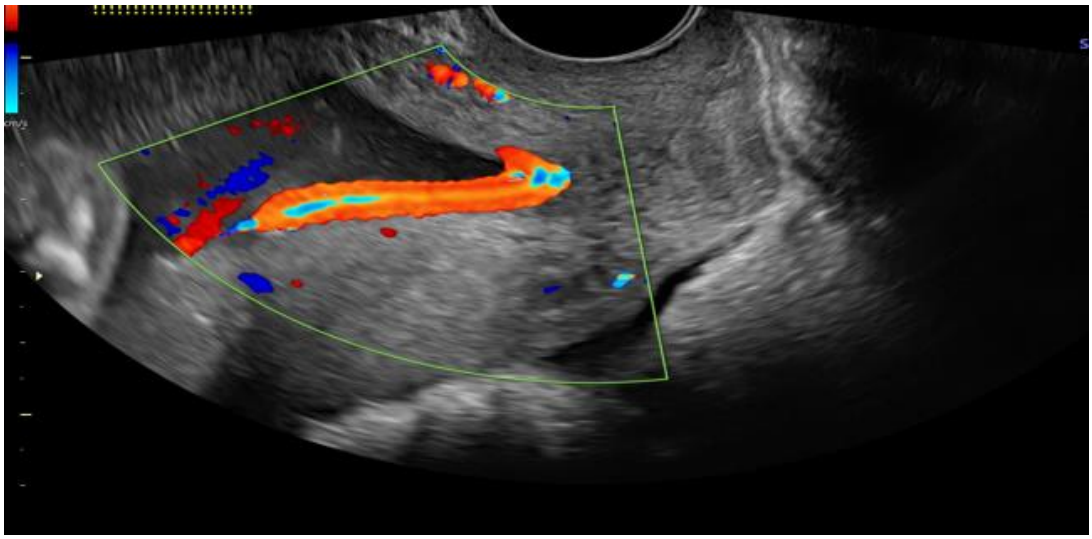
Image 1: Vasa Previa GA 21 weeks+ 6



Patient remained stable for almost 2 weeks .However, on a subsequent follow up visit at 21 weeks and 6 days gestation a new diagnosis of Vasa previawas made. A very large fetal vein traversing into the funnel of the amnion in the upper cervix and crossing directly over the internal os. The combined findings of the vasa previa along with cervical shortening pointed towards a life-threatening condition for both mother and fetus. Risks of fetal distress and hemorrhage due to rupture of membranes or preterm labour . The patient was prescribed Prometrium along with close surveillance of cervical length was done.

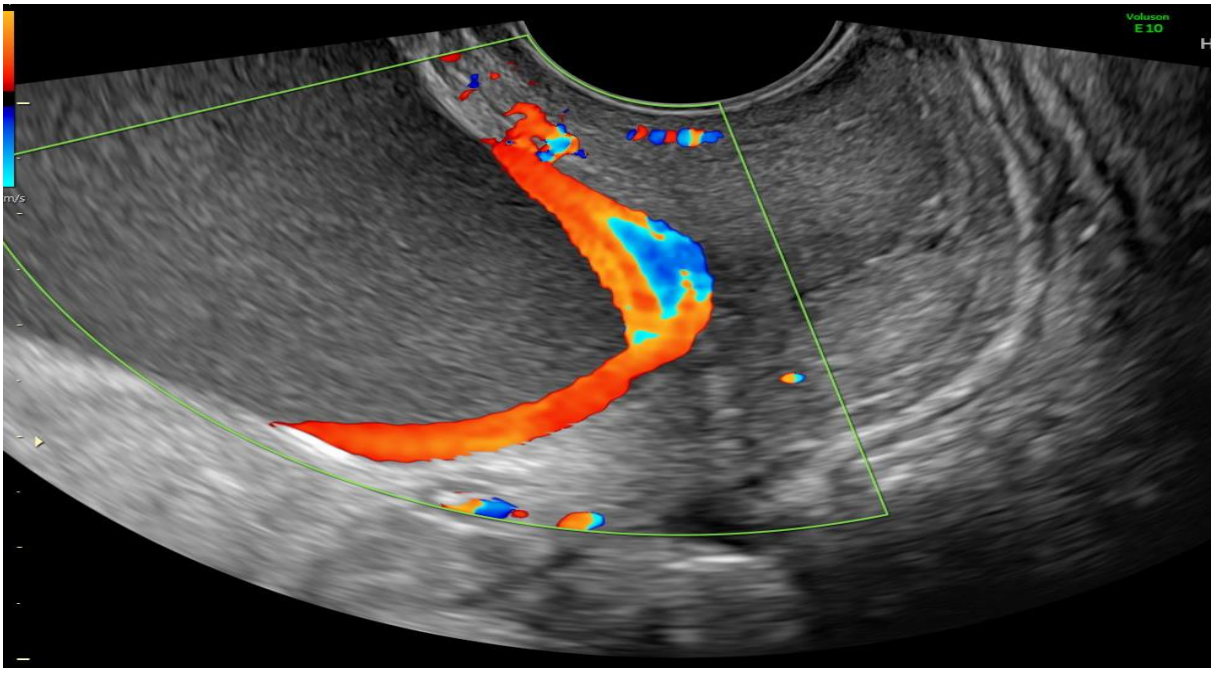


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Image 2: Vasa Previa 28 +6 weeks

The image shows the vasa previa at 28 weeks and 6 days, fortunately the cervical length remained stable, and discussion about timing of delivery started around 28 weeks especially in the in the absence of cervical change on ultrasound surveillance.
We reviewed the Canadian Neonatal Network data on morbidity and mortality and found a plateauing of risk from 29 weeks onward, and there was very little interval gain in terms of the risk of perinatal morbidity and mortality. However, given the stable cervical length , the couple decided to prolong gestation understanding risks and befits. At this point, a decision was made to monitor as an inpatient and to initiate Corticosteroids.

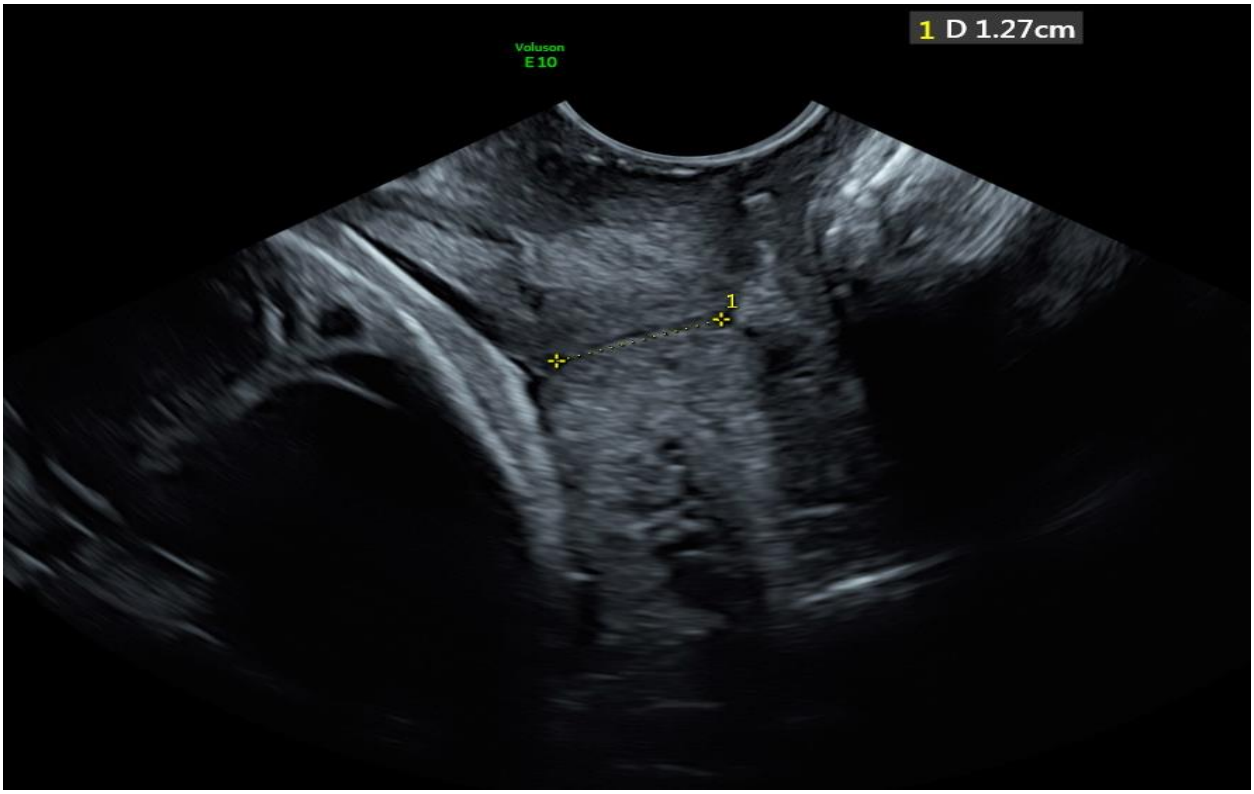

Image 3: Cervical Length at 29+5

The image shows the cervical length at 29 weeks and 5 days , further cervical shortening was observed at 1.2 cm (Compare to a stable length between 1.5 and 1.7 cm on prior weeks. With this finding, a decision was made to proceed with delivery.A lower segment cesarean section performed with no immediate complications. A single live-born female infant was delivered weighing 1440 grams. Apgar score were 8 and 9, and umbilical artery pH was 7.33. The placenta was sent to pathology .On pathology, a prominent fetal vein measuring 14 cm in length and 0.3cm diameter was noted to be traversing the amnion. This wasthe segment of the fetal vein that was noted to be traversing right over the internal os detected on fetal sonography. Fortunately, both

mother and the newborn did well postoperatively . The newborn remained in the hospital for 2 months in the NICU and discharge in stable condition after.

Conclusions:

Vasa previa is an uncommon cause of antepartum hemorrhage and is associated with the risk of rupture of fetal membranes resulting in fetal exsanguination. It's an anomaly in which there is the velamentous insertion of the low-lying placenta with the vessels traversing the lower uterine segment rite in front of the fetal presenting part(K. O. Oyelese, Turner, Lees, & Campbell, 1999). Prenatal diagnosis is one of the best ways of timely diagnosis of vasa previa. Heavy vaginal bleeding along with fetal distress demands the emergency caesarian due to a life-threatening situation for the fetus(Aoki, Obata, Odagami, Miyagi, & Aoki, 2019). YinkaOyelese et al' stated that prenatal detection of vasa previa increases the newborn survival chances to about 97%(Y. Oyelese et al., 2004). Hasegawa and his colleagues reported that asymptomatic patients with vasa previa are routinely managed at the outdoor department if there no evidence of cervical shortening on ultrasonography with no signs of hemorrhage or preterm uterine activity(Hasegawa, Arakaki, Ichizuka, &Sekizawa, 2015).

In our case, the patient was delivered electively through a lower segment caesarian section after precise detection of the course of fetal vessels as a large fetal vein was traversing through the upper cervix. In our patient, the presence of vasa previa along with cervical shortening was observed on ultrasonography. Hence, it is concluded that although vasa previa being a rare but extremely life-threatening complication has to be timely diagnosed on prenatal diagnosis. The prenatal confirmation of placenta previa along detection of cord vessels course contributes towards safe and health delivery of the baby.

Nowadays, antenatal screening of pregnant women for vasa previa is being done using the Transvaginal ultrasound along with color doppler. There is a need for setting up national organizations to heighten the awareness of vasa previa among the healthcare professionals and public.

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Primary adrenal insufficiency in pregnancy: A review article

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Abstract

Background:

Primary adrenal insufficiency is a rare disease in the general population with an estimated incidence of approximately 144 cases per million.[1,3] Congenital adrenal hyperplasia (CAH) and autoimmune adrenalitis (AA) are the two most common causes for primary adrenal insufficiency in general.[1]

Primary adrenal insufficiency can be congenital or acquired.[2] Congenital types include congenital adrenal hyperplasia (CAH), familial glucocorticoid deficiency (FGD) and congenital adrenal hypoplasia.[2]Autoimmune adrenalitis and tuberculosis account for the majority of acquired primary adrenal insufficiency.[2] In AA, there is autoimmune mediated destruction of the adrenal cortex resulting in cortisol, mineralocorticoid and androgen deficiency.[1]Polyendocrine syndrome (APS) is when this autoimmune process extend to involve the pancreas causing type 1 diabetes and the thyroid gland causing autoimmune thyroid disease.[1]

Addison disease is the term used to describe acquired primary adrenal insufficiency[2] a disease that is more prevalent in women than men with a peak incidence in third and fourth decades of life[3]. This makes good understanding of this disease during pregnancy crucial. The estimated prevalence of adrenal insufficiency during pregnancy is 10 per 100 000.[3] This includes all cases of adrenal insufficiency, primary or secondary congenital or acquired.

As mentioned, Adrenal disorders in pregnancy are not common, the autoimmune nature of the disease leading to chronic anovulation and impaired infertility is one of the reasons [13]. timely diagnosis is imperative because these disorders can lead to significant maternal and fetal morbidity. Making the diagnosis poses a challenge to the clinician because the fetal-placental unit alters the maternal endocrine metabolism and hormonal feedback mechanisms. Pregnancy and its hypermetabolic state may alter the manifestation of disease, making the diagnosis difficult.

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Fertility, rate of miscarriages:

Low fertility rates were observed in patients with classic CAH.[1] As diabetes and thyroid disease are known to impair fertility, patients with APS has significantly reduced fertility.[1] However, recent data showed that patients with isolated AA had normal fertility compared to the general population.[1] This effect is attributed to evolution in treatment of AA as well as hormonal replacement.[4] The rate of miscarriages is shown to be similar to the general population in isolated AA and higher in patients with CAH and APS.[1,4]

Fetal and maternal outcome:

Primary adrenal insufficiency was associated with higher rates of maternal and fetal complications.[1] These findings were based on observational studies from case reports.[3] In the past, maternal mortality associated with AI was as high as 35%. one-third of the fetuses died at term delivery. Diagnosis was proven at autopsy, therapeutic abortions. Nowadays, diagnosis of AI during pregnancy still difficult, especially in the first trimester because some of the symptoms are common in normal pregnancy. A family history of autoimmune disorder should be sought. When accompanied by more specific findings, such as hyperkalemia, hypoglycemia, or skin hyperpigmentation .[12]

Unrecognized AI is still the concern as this often associated with higher rates of maternal or fetal mortality either during pregnancy or in the puerperium [9.] More recent studies have attributed this correlation to poor compliance.[1] However, a large recent retrospective cohort study demonstrated higher risk of preterm delivery, small for gestation age infants, congenital anomalies and maternal mortalities in women with AA[3]. We believe that the result of this study doesn't apply for a patient with known isolated AA. In this study, there was no ICD-9 code for Addison disease in the database used and a diagnosis of corticoadrenal insufficiency was used as a proxy to Addison disease. We believe that this would cause a problem in applying these findings to patients with isolated AA. Firstly, a patient with known AA, is likely to be on appropriate hormonal replacement prior to pregnancy and is more likely to be followed in a tertiary care facility as opposed to another patient who were diagnosed during pregnancy where she was deficient in adrenal hormones for some time during her pregnancy. Secondly, corticoadrenal insufficiency is an umbrella term, under which can fit a group of endocrine diseases that are known to be associated with adverse pregnancy outcomes, for example APS.[1]

The possibility of this assumption is further supported by the fact that diabetes mellitus and thyroid disease were more common in the AA group in this study compared to the non-AA patients. Lastly, information regarding hormonal replacement were not available to the researchers and hence were not reported.

Majority of women with known AI and appropriately treated before conception have uneventful pregnancies without fetal compromise[12]. Another recent cohort study has demonstrated that birth weight and length of children born to women with AA didn't differ from the general population.[1] This is particularly true if the pregnancy occurred after the diagnosis of AA.[1] Most patients with known AA deliver at term, however there was an increase rate of caesarian section.[1]

First trimester Management:

Most cases of adrenal insufficiency in pregnancy are diagnosed before a woman becomes pregnant. AI can be dangerous during pregnancy if undiagnosed specially during the first trimester when symptoms of adrenal crisis can be similar to pregnancy-associated emesis [12]. The diagnosis may be difficult to make because many of the signs and symptoms seen in adrenal insufficiency are also seen in routine pregnancy. These include fatigue, dizziness, syncope, nausea and vomiting, weight loss, increased pigmentation and hyponatremia. Excessive dizziness, syncope, nausea, vomiting and weight loss should warrant further evaluation. Hyperpigmentation in Addison's disease can be differentiated from chloasma of pregnancy by the presence of hyperpigmentation on the non-exposed parts of the skin, creases of the hands, the extensor surfaces and mucous membranes. bluish-black spots on the lips, gums, and mucosal membranes of mouth, rectum, and vagina are more evident in adrenal insufficiency. Severe salt cravings and decrease in Na+ (Sodium) which is greater than the normal 5 mmol/L decrease in pregnancy should also warrant further evaluation. Hyponatremia with metabolic acidosis has been reported to cause poor fetal outcome. In contrast to the classic presentation of primary adrenal insufficiency, reported pregnant patients with the disorder did not present with hyperkalemia. Patients have presented in stress-induced adrenal crisis in the third trimester, triggered by illness or labor. Fetal adrenal production may be protective during pregnancy, hence an adrenal crisis may only present in the post-partum period. Careful attention must be given to the positive history of autoimmune disorders in the patient and her family members as this would make the diagnosis of Addison's disease more likely.

Morning cortisol less than 3 mg/dl or abnormal response to cosyntropin stimulation using pregnancy- specific thresholds are the main stay diagnostic tests in pregnancy. salivary cortisol levels in pregnancy has evolved, but its use for diagnostic purposes need further study to be established and used .[8]

Prednisolone is the preferred synthetic glucocorticoid as it has a very low placental transportability.[2] Fluorinated steroid on the other hand, can possibly cause intrauterine growth restriction as it crosses the placenta easily and should be avoided.[2]The dose for hydrocortisone in pregnant women is 12-15 mg/m$^{2.}$ During first trimester, inappropriate and insufficient dosing of glucocorticoid may increase the risk of miscarriages.[1]At the same time,

unnecessary high doses of glucocorticoids should be avoided during early pregnancy as its associated with increased risk of cleft lip and cleft plalate.[2]

Second, third trimester and Peripartum management:

Undiagnosed cases of AI in pregnancy are critical during the first trimester as mentioned and during the stress associated with labor and delivery[12.] *During normal pregnancy, 90%–95% of fetal cortisol derives from maternal adrenal secretions up to the 33ed week of gestation, when fetal adrenal cortisol production increases and maternal contribution decreases. Transplacental passage of cortisol from the fetus to the mother might have a partial protective effect. When maternal AI is undiagnosed, symptoms may apparat during the stress of labor, delivery, or immediate postpartum period*[12] *. Patients with primary AI are best managed by a multidisciplinary clinic that includes an endocrinologist and an obstetrician, the aim of treatment in pregnancy is to achieve a physiological glucocorticoid replacement dose to maintain good fetal and maternal outcome.*

Table 2 Proposed recommendations for management of AI in pregnancy

Pregnancy
First trimester[a]
Hydrocortisone 12–15 mg/m^2 of body surface area or 20–30 mg/day in divided doses of twice (two-thirds of the dose on wakening and one-third in the afternoon) or thrice (half the dose on wakening, quarter at lunch and quarter no later than 5 pm) a day
Fludrocortisone 0.05–0.2 mg/day depending on blood pressure and serum potassium levels. If fludrocortisone is unavailable, consider salt tablets 3–6 g orally
Third trimester[a]
Hydrocortisone 20–30 to 40–60 mg/day in divided doses of twice (two-thirds of the dose on wakening and one-third in the afternoon) or thrice (half the dose on wakening, quarter at lunch and quarter no later than 5 pm) a day
Fludrocortisone 0.05–0.2 mg/day depending on blood pressure and serum potassium levels
Labor and delivery
Hydrocortisone dose should be doubled, unless the patient is vomiting, in which IV hydrocortisone of 50–100 mg should be administered. Further dosing to be considered if labor is prolonged. If cesarean section is contemplated, stress doses of 100 mg IV hydrocortisone should be administered every 6–8 hourly or as a continuous infusion in saline over 6–8 h until delivery
Acute adrenal crisis in women undiagnosed with AI: hydrocortisone IV bolus 100–200 mg, followed by 50–100 mg boluses every 6–8 hourly, and intravenous dextrose 5 % and potassium supplementation if hypoglycemia and hypokalemia are present
Postpartum
Women with primary AI: recommence oral hydrocortisone and fludrocortisone 0.05–0.2 mg/day with taper to pre-pregnancy doses within 3 days
Women with secondary AI: recommence oral hydrocortisone 20–30 mg/day without fludrocortisone

IM intramuscular, *IV* intravenous

[a] If not able to tolerate due to nausea and vomiting, administer IM hydrocortisone 50 mg or IM dexamethasone 2 mg with IV saline infusion

[12] Adrenal insufficiency in pregnancy: challenging issues in diagnosis and management Kevin C. J. Yuen , Lindsay E. Chong, Christian A. Koch

Hydrocortisone is preferred choice at a replacement dose of 12–15 mg/m^2 of body surface area. The daily dose is usually divided in two: two thirds given on wakening and the remaining one third of daily requirement in the afternoon, to mimic the normal diurnal variation. The thrice a day regimen is the preferred one as this regimen more closely mimics the normal diurnal variation than the twice a day regimen. Hydrocortisone doses are stable initially in most cases, and may need to be increased by 20–40% during the second half of pregnancy, specially in 3rd trimester, based on clinical evaluation [8]. To compensate for the physiologic increase in CBG levels in the last trimester, increasing the doses of glucocorticoid replacement by 50 %, and the adjustment of other potentially interfering medications such as levothyroxine that can increase the metabolism of hydrocortisone is recommended.

Mineralocorticoids are required in primary AI and are continued during pregnancy. Mineralocorticoid dosages are usually stable through pregnancy; however, in some cases, dose may need to be increased during the second half of pregnancy, based on clinical evaluation (BP and electrolytes). Andreduced during the third trimester to avoid side effects. Oral fludrocortisone should be administered at daily doses between 0.05 and 0.2 mg, and should not be based on plasma renin levels as these levels are unreliable during pregnancy. Mineralocorticoids should be decreased if hypertension or hypokalemia occurs, and discontinued if Preeclampsia develops [14] .

During labor: Normal vaginal delivery is a reasonable expectation for women with AI. Indications for delivery by C-section are similar to those in a pregnant healthy individual [7] ·Stress-dose glucocorticoid treatment during delivery is required under specific circumstances. Recent studies indicate that higher doses may be needed for vaginal compared with cesarean delivery. Postpartum period adjust the dose according to clinical condition.In a minority of cases, stress doses of glucocorticoids may be necessary after delivery if the patient is in pain, recovering from surgery or having an intercurrent illness followed by preconception doses within 3-7 days. Physiological glucocorticoid replacement can continue during breast feeding, as less than 0.5% of the absorbed dose is excreted per liter of breast milk in women who received adequate glucocorticoid replacement during pregnancy, there is usually no indication to evaluate the HPA axis of their infants. Mothers who had received high doses of glucocorticoids during gestation may have infant affected by adrenal atrophy as glucocorticoids can cross the placenta and inhibit fetal glucocorticoid production.

Adrenal crisis occurring during pregnancy:

Cortisol and aldosterone replacement are the mainstay treatment of primary adrenal insufficiency either in pregnancy or not. In Addison disease, even with appropriate hormonal replacement, the ability to adapt an appropriate increase in cortisol secretion during stressful situation is lost.This can lead to a life threating state known as Addison crisis. Diagnosis of this condition at timely manner is extremely important by both patient and caregivers to avoid complications. Triggers like pregnancy, pneumonia, influenza, hyperemesis, pre-eclampsia, and during labor and delivery can lead to acute deterioration. In these circumstances, prompt glucocorticoid therapy should be administered with intravenous bolus of hydrocortisone 100–

200 mg followed by 50–100 mg boluses every 6–8 hourly, and intravenous dextrose 5 % and potassium supplementation if hypoglycemia and hypokalemia are present. Fludrocortisone is not indicated in patients with AI in the acute period due to the mineralocorticoid-like properties of high doses of hydrocortisone. Once the patient is able to tolerate oral fluids, intravenous glucocorticoid therapy can be discontinued and oral glucocorticoid therapy recommenced [12] .

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Etiology of maternal deaths in a tertiary care hospital in Oman, over 27 years (1991-2017)

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Abstract

Background:*Maternal mortality was specifically targeted by the WHO Millennium Development Goal 5 (MDG-5) which required reducing the maternal mortality ratio (MMR) by three quarters between 1990 and 2015. Although maternal MMR has changed in the Eastern Mediterranean Region, the trend of maternal deaths in the countries of the region is important.*

Methods:*This was a retrospective chart review for 27 years. Data was collected from the delivery ward register and Hospital Information System.*

Results*: There were 18 maternal deaths out of 62849 live births making the MMR 28.6 per 100,000. The direct causes were embolism* ***and hemorrhage*** *3 for each, sepsis 2 and abortion 2. The indirect causes were sickle cell disease (n=2), cardiac lesions (n=2), retroviral infection (n=1), and metastatic adenocarcinoma (n=1), Road traffic accident (n=1) and one with unknown cause brought dead (n=1).*

Conclusion*: Indirect causes contributed to maternal death over 27 years, especially* ***in second half of the study period.***

Keywords: *Maternal mortality, Causes of death, Risk factors, Oman.*

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Introduction:

World Health Organization (WHO) defines the maternal mortality as "Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes"[1]. *Maternal mortality ratio (MMR) defines the number of maternal deaths during a given period of time per 100 000 live births*[2]. *Globally**, it is estimated as** 216 per 100 000 live birth in 2015 compared to 385 per 100 000 live birth in 1990 representing drop by 44%. Still, developing regions over the world represent high unacceptable MMR **reaching** 1360 in Sierra Leone in 2015 (the highest MMR in the world)*[3].

Maternal mortality was specifically targeted by the WHO Millennium Development Goal 5 (MDG-5) which required reducing the MMR by three quarters between 1990 and 2015[4]. *The rate of reduction in maternal mortality is only 2.6% as against the expected 5.5 %, according to the Millennium development Goals*[5]. *Ending of preventable maternal deaths is the key international objective of sustainable development goals (SDG) by 2030*[6, 7]. *In 2015, MMR was 166 across the Middle East* [8]. *A review on maternal death helps define the problem, determine its scope, as well as identify the factors involved in and those leading to the problem* [9]. *Many of the reported maternal deaths and injuries are preventable entirely* [10, 11].

Sultanate of Oman is a high income country and it has achieved about 61% decrease in maternal mortality since 1990[12, 13, 14]. *However there is still scope to reduce it further by identifying the variable preventable conditions. Hence this study of maternal deaths over about 27 years was undertaken to check the etiology of maternal deaths in a single tertiary care hospital.*

Material and Methods

*This study was a **retrospective cohort chart** review study included all cases of maternal deaths at SQU hospital in the last **27** years from January 1991 to December 2017. Ethical approval was obtained from Medical research and Ethics Committee#1751.*

*Maternal death cases **were** collected from the delivery ward register at department of obstetrics and gynecology. A detailed chart review through Hospital Information System (HIS) and hard copy of the files prior to 2006 (as electronic records available only from 2006) was done to collect the demographic and clinical details.*

The main parameters of data collection followed for each maternal characteristic were age, parity, previous medical history, mode of the delivery, estimated blood loss, place of delivery, complications, number of miscarriages, and number of previous caesarean sections, infant weight and death association.

Data analysis:

A descriptive data analysis was done after entering the data into SPSS version 23.0 All the cases were separated by dividing the cases according to the year into two periods, first 14 years (1991-2004) and second 13 years (2004-2017).

Results:

There were 18 maternal deaths out of 62849 live births at SQUH and the maternal mortality ratio is 28.6 per 100,000. Seven cases of maternal mortality occurred in the first period (1991-2004) and eleven cases in the second period (2005-2017).

Table 1 shows the numerical characteristics of the 18 women who died during puerperium, labour and pregnancy during the last 27 years from 1991-2017. Majority of women were at a mean age of 32 years in the whole period (1991-2017), similar mean seen in the first period from (1991-2004) and second period from (1991-2017) .

Ten women died at age of 30-39 years, six women at 20-29 years old and only two women at 40-49 years old. Of the 18 deaths, 16 occurred in hospitals and two at home. All the women were of Omani nationality except one Egyptian female. Majority of women died during child birth and puerperium (13), two after miscarriage and three were still pregnant and not delivered at the time of death. Of the thirteen who had delivered, five were by cesarean section and eight normal deliveries. There were no significant differences in the mode of delivery among all these women.

Table 2 shows the associated complications in these women. The direct and indirect causes of maternal deaths during the two time lines are enumerated in Table 3.

Discussion

Sultanate of Oman is a high income country according to world bank[15]. Though according to the Eastern Mediterranean Region-Framework for health information systems and core indicators for monitoring health situation and health system performance, the MMR has decreased to 11 per 100,000 in 2013 in Oman; our institute rate is a bit higher at almost 28 during almost the same time period. The indirect causes were as much prevalent as the direct causes and actually were slightly more in the period from 2005 to 2017. Most of the women who died were about 32 years old and mean parity was also only two. Though age was found to be a risk factor otherwise in Oman by Islam and Bakhiet it was not a factor in our center. This is because of the small sample and a single center study. Most women in our study had vaginal delivery and cesarean section was not a contributor to mortality. In countries like Africa, cesarean section has 50 higher risk of maternal mortality due to cesarean section compared to UK as published by prospective observational cohort study crossed 183 hospitals in Africa[17].

Our findings were very similar to studies published in the gulf region such as Saudi Arabia that shows hemorrhage is the leading cause of death contributing to 43% of the direct maternal deaths and in Bahrain hemorrhage is the second leading cause of maternal mortality [18,19]. Hemorrhage still a life-threatening condition worldwide affecting 130,000 women per year [20]. Embolism is a leading cause of maternal death in UK and also contributed to the direct causes in both Saudi Arabia and Bahrain [21]. Embolism contributed to about 17% in our study.

The number of maternal deaths was apparently more in the second 13 years but mainly due to indirect causes. The direct causes were almost similar in both time lines. Sickle cell disease was a major factor in the second half and haemoglobinopathy is a significant factor for morbidity in this part of the world. Availability of matched blood without antibodies is a major challenge especially in parous women, due to the presence of atypical antibodies. The nature of these antibodies is variable and increase with transfusions and makes it difficult to get compatible blood in many instances. Our hospital is a referral center for sickle cell disease and similar experience was noted in Bahrain with reference to sicklers.[19].

The strength of our study is the observation over 27 years and an opportunity to focus on more indirect causes of death than direct causes. The retrospective nature and sample size are the limitations.

National committee is formed to review the maternal mortality and recently a near miss committee also is formed to analyze the cases as an initiative to reduce the maternal mortality further.

Declaration:

The manuscript has been read and approved by all the authors;
The requirements for authorship have been met for all the authors, based on the criteria stated by ICMJE.
Approval of all the authors regarding the order of authorship is obtained
Each author confirms that the manuscript represents honest work.
There is no conflict of interest

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Table 1: Obstetric data of women who died in 1991-2017

	Whole period (1991-2017) Mean (SD) (n = 18)	***First period (1991-2004) Mean (SD) (n = 7)***	***Second period (2005-2017) Mean (SD) (n = 11)***
Women age	*32.17 (5.05)*	*32.86 (5.64)*	*31.73 (4.88)*
Para	*2.89 (2.60)*	*4.14 (2.85)*	*2.09 (2.25)*
Gravida	*4.50 (3.20)*	*5.57 (3.45)*	*3.82 (2.99)*
Number of miscarriages	*1.08 (1.38)*	*1.00 (1.00)*	*1.13 (1.64)*
Number of previous caesarean sections	*0.60 (0.54)*	*0.50 (0.70)*	*0.67 (0.57)*
Blood loss (ml)	*1606 (2259.81)*	*1550.00 (2313.36)*	*1662.50 (2560.39)*
Infant weight (kg)	*3.06 (1.77)*	*2.63 (0.93)*	*3.31 (2.20)*

Table 2: The previous medical history of maternal deaths in 1991-2017

	First period (1991-2004) frequency (N out of 7)	***Second period (2005-2017) frequency (N out of 11)***
Previous medical disorder:		
AIDS & retrovirus	*1*	*0*
Chronic hypertension	*0*	*1*
Hypotension	*1*	*0*
Idiopathic thrombocytopenia	*1*	*0*
Malignant neoplasm	*0*	*1*
Sickle cell disease	*0*	*3*
No disorders	*4*	*6*

Table 3: Direct and Indirect causes in the two time lines

	1991-2004	***2005-2017***
Direct Causes		
Hemorrhage	*2*	*1*
Embolism	*1*	*2*
Miscarriage related	*1*	*1*
Sepsis	*0*	*2*
Indirect causes		
Cardiac disorders	*1*	*1*
Road traffic accident	*1*	*0*
Retroviral infection	*1*	*0*
Sickle cell disease	*0*	*3*
Metastatic adenocarcinoma	*0*	*1*
Unknown, brought dead	*0*	*1*

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Cesarean section scar ectopic pregnancy -a management dilemma: a case report

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Abstract

Background*: Cesarean section scar ectopic pregnancy is a rare complication of pregnancy that has increased following the increasing number of cesarean sections. It is important to have a high clinical suspicion in any patient who presents with first trimester bleeding and multiple previous cesarean deliveries. This is important because a delay in diagnosis can lead to increased maternal morbidity and mortality. Fortunately, the use of first-trimester ultrasound imaging has led to a significant number of these pregnancies being diagnosed. Early diagnosis leads to prompt management and improves the outcome by avoiding significant morbidity and allowing preservation of future fertility.*

Case Presentation: *We report a case of a 34year-old patient who had a history of two previous cesarean sections. She presented with twin viable cesarean section scar ectopic pregnancy that was diagnosed on the basis of transvaginal ultrasound imaging, and managed successfully by systemic and local (intrasac) Methotrexate. Due to timely diagnosis and management we were able to avoid complications and were able to preserve her fertility.*

Conclusion*: It is important for clinicians and radiologists managing women with risk factors for a scar ectopic pregnancy to maintain a high index of suspicion Failure to diagnose and initiate prompt management may lead to uterine rupture, massive hemorrhage, and maternal death.*

Keywords:*Cesarean scar ectopic pregnancy, Diagnostic challenge, Management*

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Background

Ectopic pregnancy is one of the leading causes of morbidity and mortality among fertile women accounting for 9% of the pregnancies-related deaths[1]. Pregnancy implantation within previous caesarean scar (caesarean scar pregnancy (CSP), is one of the rarest locations for an ectopic pregnancy occurring in approximately 1 in 2000 pregnancies.[1,2] Its incidence is rising in parallel with the increase in number of primary and repeat cesarean sections. With increased index of suspicion and liberal use of transvaginalsonography, more cases of caesarean scar pregnancy are being diagnosed in early pregnancy, thus allowing early interventions and preservation of uterus and fertility.[3]

Case Report

We describe a case of a 34-year-old lady who had history of two previous live births by cesarean sections and one miscarriage at ten weeks gestation for which evacuation was done. She presented with gestational amenorrhea of seven weeks. She was asymptomatic at presentation. Initial ultrasound done showed Caesarean scar twin monochorionic - monoamniotic pregnancy corresponding to six weeks gestation with both alive embryos. BHCG at presentation was 34156. She was admitted for systemic (IM) and local (intrasac instillation under ultrasound guidance) methotrexate after proper counselling about the risk of treatment failure and complications.

Her BHCG levels showed an initial rise as expected up to 41359 recorded after three days of methotrexate before showing a declining trend. She was followed post methotrexate with ultrasound and BHCG level. Her BHCG had reduced to 128 by 2 weeks post injection before becoming negative another 10 days later. Patient was admitted once with severe pain 2 days post methotrexate injection but was managed conservatively

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Figure 1. Ultrasound demonstrating the characteristics of cesarean scar ectopic pregnancy: Thin myometrium between gestational sac and uterine serosa.

Figure 2. Twin Monoamniotic- monochorionic pregnancy

Figure 3. Twin Viable Monoamniotic- monochorionic pregnancy

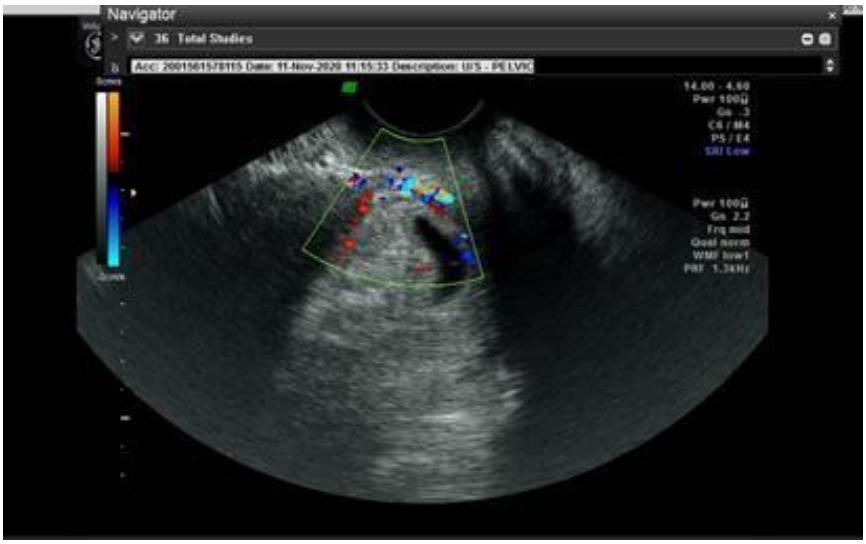

Figure 4 - collapsed sac; 1 week post methotrexate

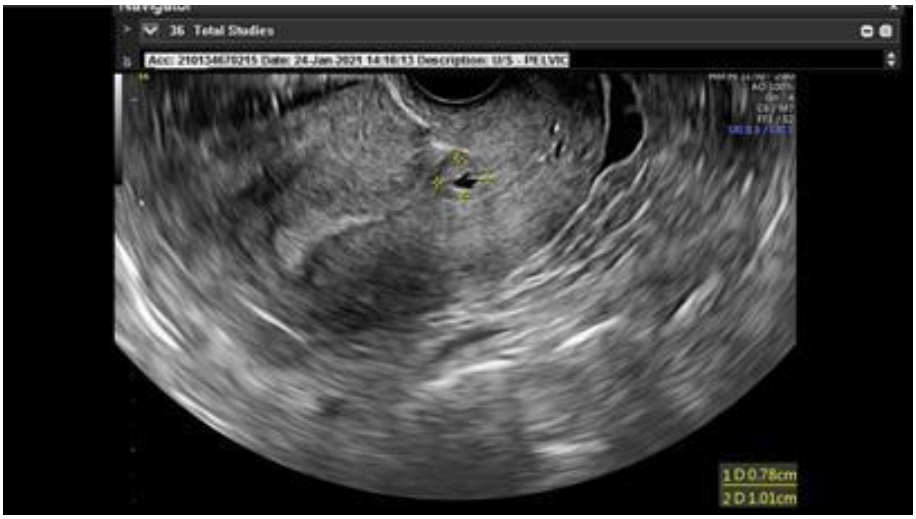

Figure 5 - Two weeks post Methotrexate

Discussion

A Caesarean scar (ectopic) pregnancy occurs when a pregnancy implants on the scar site. It is rarest of all ectopic pregnancies [1]. Incidence estimated in overall caesarean delivery is 1/1800-1/2500 [2]. It is a life threatening condition that can cause excessive haemorrage and there is risk of uterine rupture

Despite more than half of these patients experiencing greater than two cesarean deliveries, the risk for a cesarean scar ectopic does not necessarily increase with the number of cesarean deliveries. Disruption of the endometrium and myometrium after cesarean delivery predisposes to improper implantation at the site of the scar.[4]Without normal surrounding myometrium, untreated cesarean scar ectopic pregnancies can result in uterine rupture with severe maternal hemorrhage and death.

Although the incidence of cesarean scar ectopic pregnancy is uncommon, its incidence is increasing with the rising incidence of cesarean deliveries. As these pregnancies are life-threatening, it is important to identify and treat cesarean scar ectopic pregnancies to avoid significant morbidity and mortality.

The most common clinical presentation of Caesarean ectopic pregnancy is painless vaginal bleeding without any specific clinical signs.[5]For its diagnosis endovaginal ultrasonography and color flow Doppler are very helpful [6].

There are no specific diagnostic criteria for cesarean scar ectopic pregnancies however ultrasound findings should indicate an enlarged lower uterine segment with thin myometrium at the implantation site. Furthermore, the trophoblast must be located between the bladder and anterior uterine wall, fetal parts should ot be located within the uterine cavity, and there should be discontinuity of the anterior uterine wall on a sagittal view. [6] Upon implantation on the uterine scar, cesarean scar ectopic can either extend into the cervico-isthmic space and into the uterine cavity or extend deeper into the myometrium toward ttheserosal surface of the uterus

There should be differentiation of Caesarean scar pregnancy from cervical pregnancy. To differentiate from a cervical pregnancy, in transvaginalsonography no myometrium between the gestational sac and bladder must be seen, because the gestational sac grows into the anterior portion of the isthmus

MRI has important role when sonography is equivocal or inconclusive before therapy or intervention. [6]

Treatment modalities are dependent on the individual case. Women have been managed expectantly, medically with methotrexate, or surgicaly.[5,8]Apart from surgical excision at hysteroscopy or laparoscopy or laparotomy, vacuum aspiration can be used to remove the ectopic scar.The overall success rate of systemic methotrexate (MTX) and/or local injection of MTX or

potassium chloride has been reported to be 62%.[9] Dilation and curettage (D&C) has been associated with a 28% risk of hemorrhage which dropped to 4% when combined with uterine artery embolization (UAE). Hysteroscopic resection of Cesarean scar pregnancy has been reported to be unsuccessful in 12% of cases. Laparoscopic, vaginal, and open excision and repair of the defect were associated with a high success rate (≥96%) and a low risk of hemorrhage (≤4%)[9]

Our patient responded very well to a combination of systemic plus local methotrexate despite being at high risk of treatment failure in view of having twin viable pregnancies with initial high BHCG level .
She remained well post treatment and her BHCG dropped gradually over 2 weeks. We were able to avoid surgical procedure for her and avoided any significant morbidity.

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Vulvar lipoma: a Case Report

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Case Report and literature review

We reported a case of 29 years old para two patient who was presented with painful left labial mass for 3 years , a physical examination revealed freely mobile left labial tender cystic mass .
A differential diagnosis of vulvar lipoma , smooth muscle neoplasm , inclusion cyst , Bartholin cyst and epidermal cyst had been made .The patient underwent surgical excision; The mass was easily separated from the surrounding tissue, and was removed completely from its capsule. The histopathological examination revealed
Single firm discoid shape mass measure 5x4x2 cm delicate capsule brown color homogenous yellow cut section , outer surface is coated black by indian ink , partialy submitted 4 cassettes diagnosis was fibrolipoma

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Introduction:

Lipomas are widely disseminated benign mesenchymal neoplasms commonly found over the neck and upper back, shoulders, abdomen, buttocks, and proximal portions of the extremities [1,2]. Vulva localizations are rare, and very few cases have been reported [3, 4].

and its diagnosis is confirmed by the histopathological description of a well-circumscribed collection of mature adipose tissue.

The etiology of lipoma is still to be elucidated, but it has been reported that trauma [2] and gene rearrangement [3] may play a role in its development an association with gene rearrangements of chromosome 12 has been established in cases of solitary lipomas, as has an abnormality in

The HMGA2-LPP fusion gene. [5, 6]

We report the case of a vulvar lipoma that was diagnosed in a 29-year-old woman.

Our case is the first case of vulvar lipoma as of our knowledge to be reported in Saudi Arabia.

Case presentation:

We reported a case of 29 years old para two patient who was presented with painful left labial mass for 3 years , a physical examination revealed freely mobile left labial tender cystic mass .

A differential diagnosis of vulvar lipoma , smooth muscle neoplasm , inclusion cyst , Bartholin cyst and epidermal cyst had been made .[7]

The patient underwent surgical excision;

The mass was easily separated from the surrounding tissue, and was removed completely from its capsule. The

histopathological examination revealed

Single firm discoid shape mass measure 5x4x2 cm delicate capsule brown color homogenous yellow cut section , outer surface is coated black by indian ink , partialy submitted 4 cassettes diagnosis was fibrolipoma fig(1,2,3)

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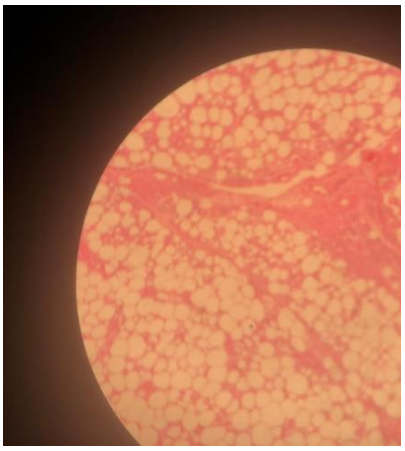

Fig 1

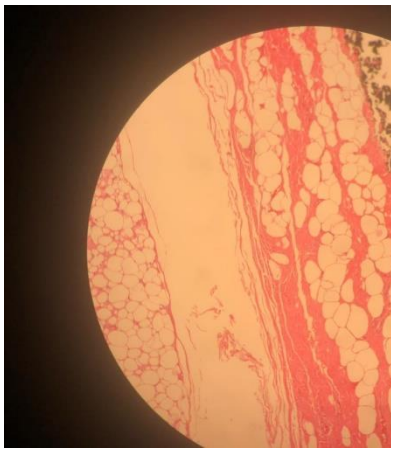

Fig 2

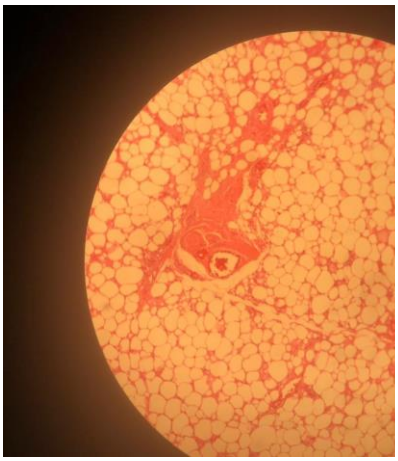

Fig 3

Discussion:

Lipomas are the most common soft tissue tumours. These slow-growing, benign fatty

Tumours form soft, lobulated masses enclosed

By a thin, fibrous capsule. Common sites are

Upper back, neck, abdomen. [1]

Lipomas occur in 1% of the population [1]

But there are very few reports of conventional lipomas in vulva,[1, 8_14] table 1

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Table: Cases of vulvar lipomas reported in literature

Author	*Age of Patient (yr)*	*Duration*	*Site*	*Size (cms)*
De Lima Filho et al	*35 years*	*10 years*	*Right labia majora*	*10*
Fukamizu et al	*7 months*	*7 months*	*Right labia majora*	*3.5 5.5 3.5*
Van Glabeke et al	*5 months*	*5 months*	*PreputiumClitoridis*	*Unknown*
Kehagias et al	*52 years*	*Unknown*	*Right labia majora*	*17 13 7*
Agarwal et al	*35 years*	*6 months*	*Left labia majora*	*4 4*
Jung Hoon Le et al	*17 years*	*12 months*	*Right labia majora*	*8.2 5.5 3.8*
Pravin N Tungenwar et al	*40 years*	*2 years*	*Right labia majora*	*4.5 3.5*
Basel Khreiset et al	*30 years*	*2 years*	*Right labia majora*	*15 x 6 cm*
Sofia Jayi et al	*27 year*	*1 year*	*Left labia majora*	*6 cm*
Hasijashweta et al	*58 year*	*10 year*	*Left labia majora*	*98*
Navenkumardekonda et al	*32 year*	*3 year*	*Right labia majora*	*6.4 3.2*
Navenkumardekonda et al	*28 year*	*1 1/2*	*Left labia majora*	*5 3*
Navenkumardekonda et al	*55 year*	*2 year*	*Left labia majora*	*9 6*
Current Case	*29 years*	*3 years*	*Left labia majora*	*5 x 4 x 2*

Lipomas can be managed conservatively, especially if they are small in size and asymptomatic, Surgical excision, liposuction, laser, ultrasound and injection of pharmaceutical agents are management options for the treatment of lipomas.[15]

If they grow large, they may cause discomfort and disfigurement, and may result in psychological and social problems.

Complete surgical excision with the capsule

Is advocated to prevent local recurrence in

Case of lipoma, while wide local excision will

Be required for liposarcoma.

Surgery also allows for excluding any malignant tumoral evolvement via a histological study [1, 2]. Typically, a histological study shows a thin peripheral capsule surrounding a lobular proliferation of adipocytes [3]. Recurrence is possible; short-term recurrence should draw the attention of clinicians to possible malignant tumor evolvement.

Conclusion:

Vulvar lipoma is extremely rare. Very few cases has been reported in literature. Treatment is adequate surgical excision.

Confirmation by histopathology is mandatory to

exclude malignancy.

To our knowledge, this is the first case of a conventional vulvar lipoma reported in Saudi arabia.

Conflict of Interests

The authors have none to declare.

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We are grateful to the woman for giving consent for her case record to be published.

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Comparison of pelvic organ prolapse recurrence between abdominal sacrocolpopexy and vaginal uterosacral ligament suspension/sacrospinous fixation

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Abstract

Introduction and Hypothesis*: Pelvic organ prolapse usually involves the descent of one or more of the vaginal walls and/or the uterus. Pregnancy and age are the most common causes. Although it is often asymptomatic, it has a high prevalence. Several approaches are used to fix pelvic organ prolapse, but the best procedure remains undetermined. In this study, we evaluated the primary surgical outcomes to compare the efficacy between abdominal sacrocolpopexy and vaginal uterosacral ligament suspension/sacrospinous fixation in fixing and preventing recurrence of utero-vaginal or vault prolapse.*

Methods*: This retrospective cohort study included 110 patients who underwent either sacrocolpopexy, uterosacral ligament suspension, or sacrospinous fixation between 2016 and 2019 at King Abdulaziz Medical City and who were followed up for >1 year using pelvic organ prolapse quantification (POP-Q). Primary outcome was Recurrence rate, and secondary outcome sexual and overall satisfaction using Likert scale. All patients who met the inclusion and exclusion criteria were included. The required data were collected from medical charts, then analyzed using the chi-square test and t-test. Results were reported as frequency, percentage, mean, and standard deviation.*

Results*: The most affected women were those aged 40-49 years with 7-9 previous deliveries; 4th degree prolapse was the most common. The most frequent procedure was sacrocolpopexy, and the most common postoperative complication was dyspareunia.*

Conclusions*: There were no differences in recurrence rates among the approaches. Uterosacral ligament suspension or sacrospinous fixation is more suitable for multiparous women with 2nd-degree prolapse as they resulted in fewer postsurgical complications (especially dyspareunia). Sacrocolpopexy may be preferred for patients with advanced pelvic organ prolapse, especially those aged 50-59 years.*
Key words*: dyspareunia, pelvic organ prolapse, postoperative complications, uterine prolapse, vaginal prolapse*

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Brief Summary: *Abdominal sacrocolpopexy and vaginal uterosacral ligament suspension/sacrospinous fixation did not differ in recurrence rates. Larger studies should be performed to validate our findings.*

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Introduction

The uterus is a muscular organ that consists of the fundus, body, and cervix. The cervix protrudes into the vaginal vault, where it opens. It is the most fixed part of the uterus, as it is attached to the back of the bladder, vaginal fornix, and other structures that directly or indirectly help to maintain the normal position (pelvic diaphragm, condensation of visceral pelvic fascia, and ligaments) [1].

There are many ligaments that support the uterus, but the most important ligaments include the round ligament for forward stability, transverse cervical ligament for lateral stability, and uterosacral ligaments for backward stability [1].

Pelvic support is provided mostly by the levator ani muscles and connective tissue attaching the vagina to the sidewalls and pelvis. With normal pelvic support, the vagina lies horizontal to the levator ani muscles. When the levator ani muscles are damaged, its position becomes more vertical and the vaginal opening widens, shifting support to the connective tissue attachments. Biomechanical studies have revealed that, during the second stage of labor, the levator ani muscles are stretched by >200%, beyond the threshold for stretch injuries [2].

Pelvic organ prolapse (POP) in gynecology is defined as herniation of the anterior vaginal wall, posterior vaginal wall, uterus, or vaginal apex into the vagina; descent may involve one or more structures (Figure 1) [2]. POP symptoms typically include vaginal bulge, pelvic pressure or heaviness, abnormal voiding or defecation, and sexual dysfunction [3].

Although POP can affect women of all ages, it is more common in older women [2]. Other risk factors for POP are categorized as obstetrical factors (parity and vaginal delivery), lifestyle

factors (higher body mass index), unmodifiable risk factors (ethnicity), and other risk factors associated with increased intra-abdominal pressure (constipation, difficult labor, and chronic obstructive pulmonary disease) [4].
Despite the high prevalence of POP, our knowledge of its pathophysiology is limited. Prolapse may result from defective supportive structures with normal levels of intraabdominal pressure or from normal pelvic support structures with chronically high levels of intra-abdominal pressure [3]. More than two-thirds of parous women have objective evidence of POP upon clinical examination. Most of these defects are asymptomatic, and few require surgical intervention [5].

In cases that do require intervention, the following apical suspension procedures may be used: sacrocolpopexy (SCP), uterosacral ligament suspension (USLS), or sacrospinous fixation (SSF) [6]. POP surgeries may be reconstructive or obliterative; reconstructive surgery corrects the prolapse while restoring normal vaginal anatomy, while obliterative surgery corrects the prolapse by closing off the vaginal canal either partly or completely. Therefore, reconstructive surgery is the appropriate choice for women who are or intend to be sexually active. Obliterative surgery should be considered as a first-line surgical procedure for fragile, older women with advanced POP who no longer desire vaginal intercourse.

The choice of apical suspension procedure should be individualized for each patient. SCP, which is the fixation of the uterus or vault to sacral promontory by using synthetic mesh and laparoscopy, is the preferred approach. It is appropriate for women at risk for prolapse recurrence [6]. USLS involves fixing the vault to the uterosacral ligament that attaches to the uterus anteriorly and the sacrum posteriorly. SSF, on the other hand, is always vaginal. It involves fixing the vault to the right sacrospinous ligament, which is a triangular area attached to the sacrum, coccyx, and ischial spine. For the purpose of this study, we grouped cases that had undergone USLS and SSF procedures together, as both were performed using vaginal approaches, and both had similar preparations, intraoperative durations, and postoperative care interventions, and many postoperative complications. Lastly, grouping them together ensured a good sample size.

Few studies have been conducted on this topic, especially in Middle Eastern countries. One study reported that the recurrence rate for stage III prolapse was lower after SCP than after USLS. However, there was no difference in the rates of recurrence of preoperative 2nd-degree prolapse between the two procedures, and mesh augmentation may not be necessary for these patients [7].

Another study reported a lower rate of recurrent vault prolapse and less dyspareunia with abdominal SCP than with vaginal SSF. These benefits must be balanced against the longer procedure time, longer time to return to daily activities, and increased cost associated with SCP [8]. Abdominal SCP is more effective in correcting advanced stages of uterovaginal or vault prolapse, but it is associated with more intra- and postoperative morbidity compared to vaginal sacrospinous ligament fixation [9]. Vaginal sacrospinous ligament fixation is the procedure of choice for patients with other medical disorders [9], as it required shorter operative time.

Some studies showed no differences in the complication and/or cure rates but did find slightly better long-term anatomical outcomes after SCP [10]. In all SCP and USLS/SSF, the patients achieved the same success rates and levels of function [11]. There is no strong evidence supporting one procedure over the other, and it remains unclear which operations lead to the best results and patient satisfaction [12].

In this study, we compared the efficacies of abdominal SCP and vaginal USLS/SSF procedures for fixing uterovaginal or vault prolapse in preventing POP recurrence by examining primary surgical outcomes. We also examined the secondary outcome of patient satisfaction, taking into consideration age, type of prolapse, and the patient's medical condition prior to the procedure.

Materials and Methods

Study setting

The study was conducted at King Abdul-Aziz Medical City, a tertiary teaching hospital in Riyadh, Saudi Arabia. The hospital provides care in subspecialties, such as general obstetrics and gynecology, maternal-fetal medicine, in vitro fertilization, and urogynecology.

The obstetrics and gynecology department has 110 beds; the outpatient clinic receives almost 2,000 patients per week and delivers almost 10,000 babies per year.

In the urogynecology department, all procedures are performed by expert urogynecology surgeons assisted by senior residents in their 4th or 5th years.

Patients

All patients from 2016 to 2019 who met the following inclusion criteria were included:

middle-aged women (aged 30-75 years); patients with POP (stages II-IV or vault prolapse); and patients who underwent either abdominal laparoscopic SCP or vaginal USLS or vaginal

SSF. Patients who have undergone previous POP surgery were excluded.

Study design

This retrospective cohort study included all patients (n = 110) from 2016 to 2019 who underwent procedures utilizing one of the two approaches, abdominal SCP or vaginal

USLS/SSF, and who were followed up for at least 1 year after the surgery using (POP-Q). We used non-probability consecutive sampling, where all patients who met the inclusion and exclusion criteria were included in the study.

Data collection, instruments, and measurements

Data were collected from patients' medical charts, retrieved from operative schedules.

Patients were grouped according to the type of operation, either abdominal SCP or vaginal USLS/SSF. All patients were followed up for at least 1 year to assess the outcome; operation length, complications, and length of admission were also evaluated.

Statistical analysis

Data were analyzed using SPSS statistical software for Windows version 20 (Riyadh, Saudi Arabia). Categorical data were expressed as frequency and percentage, and numerical data were measured using the standard deviation (SD). The chi-squared test was used to assess associations between outcomes and group variables. A p-value <0.05 was considered significant.

Ethical considerations

Our study was approved by the King Abdullah International Medical Research Center at

Riyadh (IRP No. H-01-R-005), and the work undertaken conforms to the provisions of the Declaration of Helsinki. The study does not violate the polices or/and procedures established by the journal. The ethics committee waived the requirement for informed consent due to the retrospective study design. All data were collected through chart review. Only the research team was authorized to access patient information. No medical record number or names are mentioned in the study.

Results

This study was designed to compare the efficacy of abdominal SCP with that of vaginal

USLS/SSF in preventing POP recurrence and to examine differences in patient satisfaction. We targeted and electively enrolled 110 women into the study; all were treated and attended follow-up appointments at King Abdul-Aziz Medical City in Riyadh, Saudi Arabia.
Table 1 shows the patients' socio-demographic characteristics. The mean age was 53.99 years (SD=11.3; range, 29-73 years). The most affected group was those aged 40-49 years, which accounted for approximately 33.6% of the recruited women.

Table 2 shows the surgical and medical outcome characteristics. All women were diagnosed with uterine prolapse before surgery, and the degree of uterine prolapse as documented in their pre-

surgical notes was analyzed (Figure 2a). Our review of the medical records of these women revealed that 20% developed one or more post-surgical complications (Figure 2b).

To examine differences in socio-demographics and surgical and past medical outcomes between the two groups, we compared them using bivariate analytical methods; the results are displayed in Tables 3 and 4. Starting with primary hypothesis, the analysis showed that the POP recurrence rate was not significantly different between the two approaches. Which 2nd degree and more POP considered recurrence. However, the chi-square test of association showed that women who underwent USLS or SSF were significantly less likely to develop post-surgical complications of any type ($p = 0.017$) (Figure 2c). Women who underwent USLS or SSF were significantly less likely to have had dyspareunia than those who underwent SCP ($p = 0.031$), but the other types of postoperative complications did not differ between the two groups.

The age distribution (years) of the women undergoing the two approaches of surgical apical uterine repair procedures (abdominal SCP vs. vaginal USLS, SSF) did not differ significantly ($p = 0.216$) according to the independent groups t-test, but the chi-square test comparing the age groups of women who underwent each surgical type showed that women aged 50-59 years were slightly less inclined to undergo a USLS or SSF surgical repair for their uterine prolapse ($p = 0.085$).
Moreover, comorbidity was not significantly correlated with the received uterine prolapse surgical interventions ($p = 0.372$) according to the chi-square test; the types of complications developed was also not significantly correlated with the type of surgical intervention ($p > 0.050$).

The women's mean number of previous pregnancies was not significantly correlated with their choice of uterine prolapse repair surgical intervention ($p = 0.131$) according to the independent t-test, but the chi-square test of the association showed that the parity number was slightly correlated with the received uterine prolapse surgical intervention ($p = 0.074$). In general, women with 7-9 previous pregnancies were slightly more inclined to undergo USLS and SSF than SCP.

A medical history of cesarean section was not significantly correlated with the type of uterine prolapse repair. Table 4 shows the results of the bivariate analysis of the associations between surgical intervention types and their disease characteristics and surgical outcomes. The analysis results suggest that women with 2nd-degree uterine prolapse were significantly more likely to have undergone USLS or SSF than SCP for uterine prolapse problems ($p < 0.001$).

On average, the women who underwent SCP required a longer intraoperative time

(mean rank duration = 70.15 min) than those who underwent USLS/SSF (mean rank duration = 28.83 min; $p < 0.001$), indicating that SCP may require significantly longer intraoperative surgical time than USLS/SSF according to the Mann-Whitney U test.

Nonetheless, the length of hospital stays post-surgery did not differ significantly between the two groups ($p = 0.556$), nor did the elapsed time since the surgery ($p = 0.328$) according to the Mann-Whitney U test. The sexual satisfaction self-rating did not differ significantly between the groups according to an independent t-test; however, women who had received USLS or SSF may

have experienced slightly greater sexual satisfaction than those who received SCP (p = 0.189). In addition, the overall surgical satisfaction did not differ between the two groups.

Discussion

This retrospective cohort study compared the efficacy between abdominal SCP and vaginal

USLS/SSF for the treatment of uterovaginal prolapse in preventing POP recurrence as Primary outcome and in terms of the sexual and overall patient satisfaction as secondary outcome.

Our study showed different results when using different statistical tests (t-test, chisquare test, Mann-Whitney U test). No difference in our primary hypothesis POP recurrence between two approaches in follow up using POP-Q ,which 2nd degree POP considered recurrence. Women aged between 50 and 59 years were less likely to undergo USLS or SSF. This may be because, at this age, women are still sexually active [6]. Another study reported that SCP resulted in slightly better long-term anatomical outcomes; hence, it is a preferable treatment option for young or sexually-active women [10].

Frail women may prefer to undergo USLS or SSF rather than SCP, because SCP requires more intraoperative time and because they may have other medical problems [6, 9].

In this study, women with 7-9 previous pregnancies were slightly more inclined to undergo

USLS or SSF than SCP for the same reasons.

In this study, women with 2nd-degree prolapse were significantly more likely to undergo USLS or SSF than SCP, but this prolapse severity may be associated with slightly younger ages.

USLS or SSF showed significant results, as their intraoperative time was short and the women were less likely to develop post-surgical complications, especially dyspareunia. In contrast, other studies have shown SCP to be a minimally invasive approach associated with lesser blood loss, shorter hospital stay, longer operative time, and lower prolapse recurrence rate than USLS or SSF for patients with 3rd-degree uterine prolapse [6, 7]. SCP may be preferable for patients with advanced POP, particularly those aged 50-59 years.

With regard to POP recurrence, a Danish cohort study reported that the reoperation rate was lowest for the apical compartment but highest in all three compartments during the first year after primary surgery. In all three compartments, the reoperation rate peaked in the group of women who underwent primary surgery before menopause [13].

In contrast, no significant differences were found in comorbidities, history of cesarean section, length of hospital stay after surgery, or time elapsed since surgery. In addition, differences in postoperative sexual satisfaction and overall satisfaction were not significant (P

> 0.05).

This study had several strengths. It provides a strong level of evidence, and the bivariate analysis we used decreased the risk of confounding variables. The patients in this study were followed for >1 year, which increased the likelihood that, if a patient was going to experience recurrence, it would appear during the study period. Regarding the limitations, the sample size (n=110) was smaller than the required sample size calculated before the study was conducted using Piface (n=219). Furthermore, the use of a chart review may have weakened the results due to response bias. Since there are no similar studies in Arab countries and few globally, this study will serve as a reference for future studies. Further research and larger samples are needed to confirm our findings and determine the best procedure for POP correction and prevention of POP recurrence.

In conclusion, this retrospective cohort study revealed no differences in recurrence rates between the two approaches. Further research on long-term outcomes and with larger sample sizes should be carried out to validate our findings, this study will serve as a reference for future studies.

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