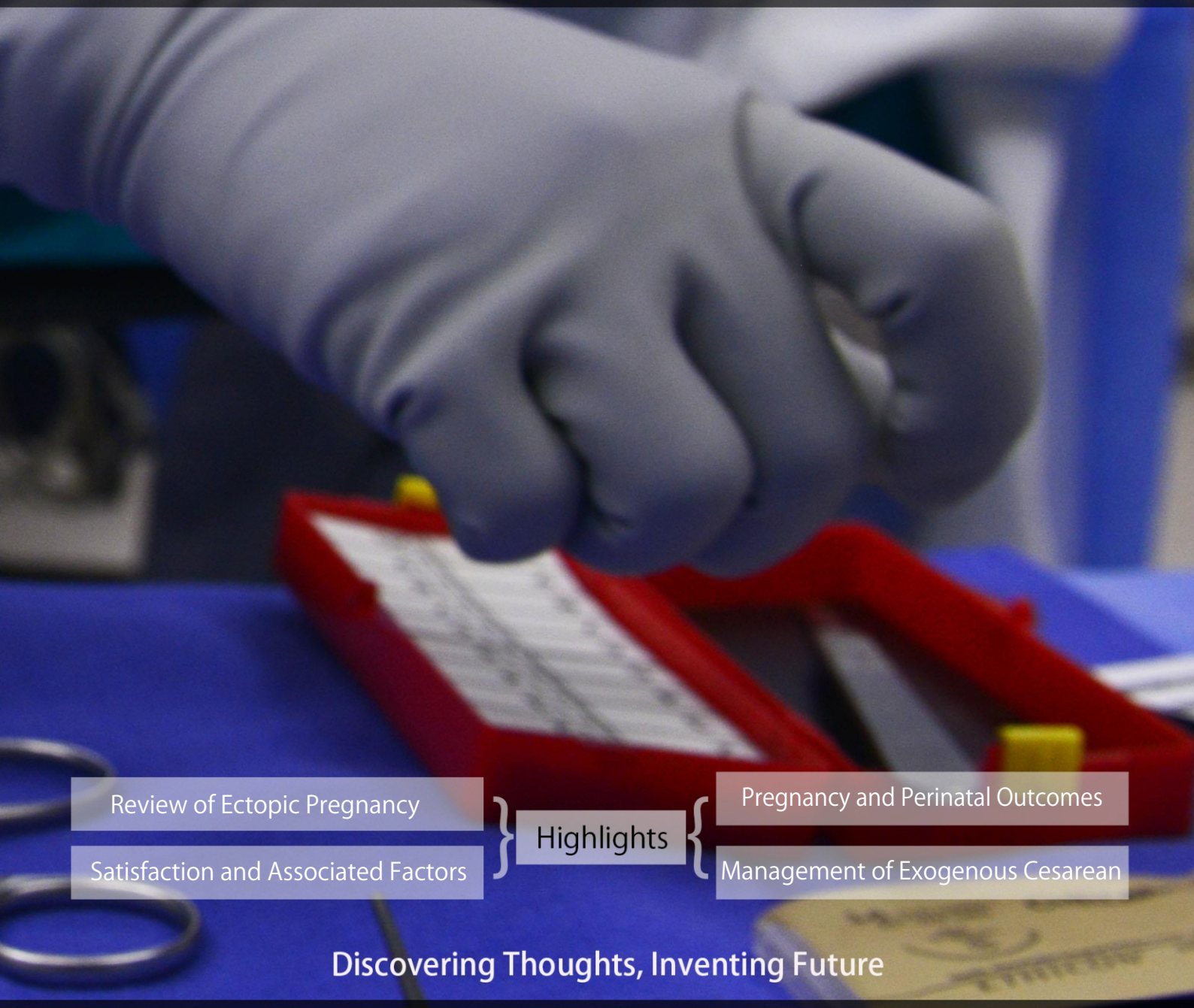
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Review of Ectopic Pregnancy

Satisfaction and Associated Factors

Highlights

Pregnancy and Perinatal Outcomes

Management of Exogenous Cesarean

Discovering Thoughts, Inventing Future

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Pregnant Women with Morbid Obesity: Pregnancy and Perinatal Outcomes

By Amparo Carrasco Catena, Nerea Ruiz Sacedón, Ester Ortiz Murillo & Reyes Balanzá Chancosa

Abstract- The aim of this study is to evaluate obstetric complications and perinatal outcomes in pregnant women with morbid obesity (BMI≥ 40.0 kg/m^2) compared to pregnant women with normal weight (BM I 18.5-24.9 kg/m^2). It is a retrospective case-control study undertaken by the Department of Obstetrics at Hospital Universitario Doctor Peset, Valencia (Spain) between May 2008 and July 2016. A total of 50 patients were included in each study group. Morbidly obese pregnant patients had a higher rate of nulliparity (P = 0.03), chronic hypertension (P = 0.008), preeclampsia (P = 0.03), gestational diabetes (P = 0.013) and delivery by caesarean section (P = 0.04) compared to control patients with normal weight. A closer monitoring of morbidly obese pregnant women is recommended to prevent, reduce and properly handle the complications that may arise during pregnancy, both for the mother and the fetus.

Keywords: *obesity, morbid obesity, pregnancy complications, maternal outcomes, perinatal outcomes.*

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Pregnant Women with Morbid Obesity: Pregnancy and Perinatal Outcomes

Amparo Carrasco Catena [α], Nerea Ruiz Sacedón [σ], Ester Ortiz Murillo [ρ] & Reyes Balanzá Chancosa [ω]

Abstract- The aim of this study is to evaluate obstetric complications and perinatal outcomes in pregnant women with morbid obesity (BMI ≥ 40.0 kg/m²) compared to pregnant women with normal weight (BMI 18.5-24.9 kg/m²). It is a retrospective case-control study undertaken by the Department of Obstetrics at Hospital Universitario Doctor Peset, Valencia (Spain) between May 2008 and July 2016. A total of 50 patients were included in each study group. Morbidly obese pregnant patients had a higher rate of nulliparity (P = 0.03), chronic hypertension (P = 0.008), preeclampsia (P = 0.03), gestational diabetes (P = 0.013) and delivery by caesarean section (P = 0.04) compared to control patients with normal weight. A closer monitoring of morbidly obese pregnant women is recommended to prevent, reduce and properly handle the complications that may arise during pregnancy, both for the mother and the fetus.

Keywords: obesity, morbid obesity, pregnancy complications, maternal outcomes, perinatal outcomes.

I. Introduction

There is an increase in obesity in developed countries, multifactorial in origin, which combines the lack of physical exercise, changes in diet composition and increased caloric intake. Although overweight is an increasingly important global health problem, the lack of motivation to face it more decisively in daily clinical practice is worrying.

The World Health Organization defines normal weight, overweight, obesity and morbid obesity as body mass index (BMI) of 18.5 to 24.9; 25 to 29.9; 30 to 39.9 and 40 or higher, respectively.

Spain is not an exception in this trend, but rather the opposite. Obesity in our country is reaching more worrying figures and comparative studies with other countries around place us at the forefront, with overall prevalence figures, both in children and adults, of around 25% (Finucane et al. 1980). According to the latest National Health Survey of Spain published in 2012, the main results highlight the continuous rise in obesity, affecting 17% of the adult population (INE 2013).

The prevalence of obesity in women of reproductive age and pregnant women varies widely depending on the definition, the year and the characteristics of the study population, but it has increased in line with an increased prevalence of obesity in the general population. This alarming increase has made that more than a fifth of the European women who become pregnant in developed countries enter the clinical category of obesity (WHO 2014; Basterra-Gortari et al. 2011).

Obesity in women can negatively affect the course of pregnancy, with complications for both the mother and the fetus. The associated risks for obese pregnant women include: gestational diabetes (Sebie et al. 2001), gestational hypertension or preeclampsia (Bhattacharya et al. 2007), thromboembolism (Larsena et al. 2006), back pain, sciatic pain, increased fatigue (Agha et al. 2014), slower labour progression (Vahratian et al 2004), higher rate of instrumental or caesarean deliveries, surgical wound infection, postpartum hemorrhage (Sebie et al. 2001) and maternal death (Drife et al. 2005). Fetal risks associated with obese pregnant women include: spontaneous abortions, congenital anomalies (Stothard et al. 2009), macrosomia (Bianco et al. 1998), shoulder dystocia, stillbirth (Chu et al. 2007) and neonatal death (Kristensen et al. 2005).

A 2010 publication of the Royal College of Obstetricians and Gynaecologists (RCOG) gathers the rate of complications associated with obesity during pregnancy and includes: hypertensive disorders (OR 3.3, 95% CI 2.7-3.9), venous thromboembolism (OR 9.7, 95% CI 3.1-30.8), gestational diabetes (OR 2.4, 95% CI 2.2-2.7), elective caesarean section (OR 2.1, 95% CI 1.9-2.3), emergency caesarean section (OR 2.0, 95% CI 1.2-3.5), postpartum hemorrhage (OR 2.3, 95% CI 2.1-2.6), surgical wound infection (OR 2.2, 95% CI 1.0-2.6), congenital malformations (OR 1.6, 95% CI 1.0-2.5), prematurity (OR 1.2, 95% CI 1.1-1.4), macrosomia (OR 2.4, 95% CI 2.2-2.5), shoulder dystocia (OR 2.9, 95% CI 1.4-5.8), neonatal admission (OR 1.5, 95% CI 1.1-2.3), stillbirth (OR 2.1, 95% CI 1.5-2.7) and neonatal death (OR 2.6, 95% CI 1.2-5.8) (RCOG 2010).

The main aim of our study is to evaluate obstetric complications and perinatal outcomes in patients with morbid obesity (BMI ≥ 40.0 kg/m²) controlled in the Obstetric Unit of Hospital Universitario Dr. Peset in Valencia, Spain.

Its secondary objective is to compare the results obtained in morbidly obese patients with a control group of pregnant women with normal weight

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(BMI 18.5-24.9 kg/m²) controlled in the same Hospital Unit.

II. Materials and Methods

This is an observational and retrospective case-control study in which obstetrical complications and perinatal outcomes in patients with morbid obesity (BMI ≥ 40.0 kg/m²) were evaluated and compared with those in patients with normal weight (BMI 18.5 to 24.9 kg/m²) in the time period between May 2008 and July 2016.

In the case group, patients with singleton pregnancies, controlled in our High Risk Obstetric Unit and who met the criteria for morbid obesity - defined as BMI ≥ 40 kg/m² according to the World H ealth Organization (WHO) - were included.

The control group was made of patients with singleton pregnancies and normal weight (BMI 18.5-24.9 kg/m²) controlled in the same Hospital Unit during the same period.

The maternal characteristics included and compared between the two groups were: age, parity, BMI, pregestational diabetes and chronic hypertension. The analyzed maternal outcomes included preeclampsia, gestational diabetes, spontaneous onset of labour versus induced labour, mode of delivery, postpartum hemorrhage and venous thromboembolism. As neonatal outcomes, gestational age at birth, prematurity (defined as gestational age less than 37 weeks), weight at birth, Apgar score at one minute and five minutes after birth and umbilical cord blood pH were included.

The analysis of the data and the results were obtained by using the statistical software SPSS version 20 and Microsoft Excel 2007. For both groups descriptive statistics were used. The variables are expressed in percentages and means ± standard error. The statistical significance tests used were the Chi-square and Fisher's exact test for dichotomous qualitative variables and the Student t for continuous variables. For quantitative variables, multiple regression models were used. In all cases, statistically significant differences were considered when $p < 0.05$.

The study was approved by the Ethics Committee for Ethics in Clinical Research of the hospital. Informed consent was obtained from all the participants and the confidentiality of all of them was maintained.

III. Results

A total of 50 patients were included in both study groups.

The demographic characteristics of both groups are shown in Table 1. Within the group of morbidly obese patients, the mean age was 30.95 years (22-45) and the mean BMI 43.36 kg/m² (40-58). In the group of patients with normal weight, the average age was 29.76 years (22-41) and the average BMI 22.27 kg/m² (20-24.9).

Table 1: Demographic characteristics of the patients.[a]

Characteristics	Pregnant women with normal weight (n=50)[b]	Pregnant women with morbid obesity (n=50)[c]	*P* value
Age (years)	29.76	30.95	-
BMI (kg/m²)	22.27	43.36	-
Parity	Nulliparous 23 (46) Prev. caesarean section 16 (32) Prev. vaginal delivery 10 (20)	Nulliparous 20 (40) Prev. caesarean section 19 (38) Prev. vaginal delivery 11 (22)	0.03 NS NS
Pregestational diabetes	1 (2)	5 (10)	NS
Chronic hypertension	1 (2)	10 (20)	0.008

Abbreviations: BMI, Body Mass Index; NS, Not Significant.
[a] Mean values ± standard deviations or percentage (%).
[b] BMI 20.0-24.9 kg/m².
[c] BMI ≥40 kg/m².

The morbidly obese patients had a higher rate of nulliparity (P = 0.03) and chronic hypertension (P = 0.008) than patients with normal weight. Neither statistically significant differences in the previous mode of delivery (caesarean section or vaginal) nor a history of pregestational diabetes were found.

Maternal outcomes were obtained by univariate analysis and are shown in Table 2. In the group of morbidly obese patients, higher rates of preeclampsia (P = 0.03), gestational diabetes (P = 0.013) and delivery by caesarean section (P = 0.04) were recorded compared to control patients with normal weight. There were no differences in the onset of labour and in the occurrence of postpartum venous thromboembolism between the two study groups. However, there were more cases of postpartum hemorrhage in obese patients than in the group of patients with normal weight (14% vs 4%), but this difference did not reach statistical significance.

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Table 2: Maternal outcomes.[a]

Results	Pregnant women with normal weight (n=50)[b]	Pregnant women with morbid obesity (n=50)[c]	*P*value
Preeclampsia	2 (4)	10 (20)	0.03
Gestational diabetes	3 (6)	12 (24)	0.013
Onset of labour	Spontaneous 27 (54) Induced 23 (46)	Spontaneous 14 (28) Induced 36 (72)	NS NS
Delivery	Vaginal 36 (72) Caesarean section 14 (28)	Vaginal 28 (56) Caesarean section 22 (44)	NS 0.04
Postpartum hemorrhage	2 (4)	7 (14)	NS
Venous tromboembolism	0	0	NS

Abbreviations: BMI, Body Mass Index; NS, Not Significant.
[a] Mean values ± standard deviations or percentage (%).
[b] BMI 20.0-24.9 kg/m^2.
[c] BMI ≥40 kg/m^2.

Perinatal outcomes of the study are shown in Table 3. In our study, no statistically significant differences in terms of perinatal outcomes were found compared to those obtained in the group of patients with normal weight.

Table 3: Perinatal results.[a]

Results	Pregnant women with normal weight (n=50)[b]	Pregnant women with normal obesity (n=50)[c]	*P*value
Gestational age > 37 weeks	49 (98)	48 (96)	NS
Gestational age < 37 weeks	1 (2)	2 (4)	NS
Weight after birth (g)	3668±158	3880±191	NS
Weight after birth > 4000g	4 (8)	8 (16)	NS
Weight after birth < 2500g	2 (4)	4 (8)	NS
Apgar < 7 (1 minut)	1 (2)	7 (14)	NS
Apgar < 7 (5 minuts)	1 (2)	0	NS
Umbilical cord blood pH < 7,20	5 (10)	9 (18)	NS

Abbreviations: NS, Not Significant.
[a] Mean values ± standard deviations or percentage (%).
[b] BMI 20.0-24.9 kg/m^2.
[c] BMI ≥40 kg/m^2.

IV. Discussion

Overweight and obesity among pregnant women have recently become a worldwide problem.

Obesity during pregnancy is associated with many maternal and perinatal risks. The appearance of these risks is proportional to the degree of obesity presented by the patient (Torloni et al. 2009; Scott-Pillai et al. 2013; Blomberg et al. 2013). Managing these problems and potentially reduce their risks is currently a challenge for specialists in Obstetrics (Gunatilake et al. 2011).

In our review, morbidly obese patients (BMI ≥ 40.0 kg/m^2) had higher nulliparity (40%) and chronic hypertension (20%) rates than control patients with normal weight. However no significant data regarding pregestational diabetes were found. These data are consistent with the study published by Crane et al (Crane et al. 2013), where pregnant women with extreme obesity (BMI≥ 50 kg /m^2) presented higher nulliparity (59.2%), chronic hypertension (7%) and pregestational diabetes (5.6%) rates than the control patients with normal weight.

According to our figures, from the total of our obese pregnant patients, 10 (20%) had preeclampsia, 12 (24%) gestational diabetes and 22 (44%) delivered by caesarean section. 4 (8%) out of the obese pregnant women who developed preeclampsia during pregnancy, suffered already from chronic hypertension at the beginning of the study. These data are similar to those obtained in other studies (Crane et al. 2013; Weisset al. 2004). According to the literature reviewed, pregnant women with obesity (BMI ≥ 30.0 kg/m^2 have a higher prevalence of gestational diabetes (Ehrenberg et al. 2002, Gross et al.1980), higher rates of hypertensive disorders of pregnancy (Robinson et al. 2005; O'Brien et al. 2003; Gaillard et al. 2011) and a higher rate of induction and failure of labour induction (Denison et al.2008; Wolfe et al. 2011) than the general obstetric population.

In our study, a total of 7 patients (14%) had postpartum hemorrhage, all managed by conservative measures. With regard to venous thromboembolism, no cases were found in any of our both study groups. This result can be explained because all the morbidly obese

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pregnant patients in our Obstetrics Unit are treated with low molecular weight heparins in prophylactic doses administered daily during pregnancy. According to the latest Uptodate 2016 on obesity and pregnancy, there is a clear association between maternal obesity and the risk of postpartum hemorrhage (Sebie et al. 2001) and venous thromboembolism (Nuthalapaty et al. 2016).

In our review, the average weight of the babies of morbidly obese mothers was 3880 g. 4% of fetuses were premature compared to 8.5% in other studies (). The percentage of macrosomes was 16% in contrast to 38% in Crane et al (Crane et al. 2013) or 12.3% in Wahhabi et al (Wahabi et al. 2014). Total newborns weighing <2500 g. was 4 (8%), a figure that contrasts with other studies where the percentage is around 4% (Crane et al. 2013; Wahabi et al. 2014). This data is justified by the percentage of chronic hypertensive patients among the obese patients included in the study. According to similar studies published, pregnant women with morbid obesity present higher risk of congenital malformations (Wahabi et al. 2014), prematurity, macrosomic fetuses, shoulder dystocia (RCOG 2010) as well as neonatal admissions, stilldeath and neonatal death (Aune et al. 2014).

We are aware of the limitations of our study. On the one hand, because of the retrospective nature of our research; on the other hand, because of the small sample size of the study group (N=50). This could explain the lack of statistical significance in most of the variables studied.

V. Conclusion

Pregnant women with morbid obesity (BMI ≥ 40.0 kg/m^2) present a higher risk of maternal and perinatal complications. Therefore, further development and the elaboration of programs from the preconception period are recommended. This should be done in specialized units that value individual needs and the risk factors of each patient in order to prevent, reduce and properly handle the complications that may arise for both mother and fetus.

Declaration of Interest

The authors declare no conflict of interest. The authors are the only responsible for the content and the writing of the paper.

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A 10 Year Review of Ectopic Pregnancy in University College Hospital, Ibadan, Nigeria

By Oluwasomidoyin Olukemi Bello & Opeyemi Rebecca Akinajo
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Abstract- Ectopic pregnancy (EP) is a public health issue all over the world and remains a major gynaecological problem in contemporary gynaecological practice. We assessed the risk factors for EP among women presenting at a tertiary health facility, University College Hospital (UCH), Ibadan, Nigeria.

A10 year's retrospective study of EP cases managed in UCH. Information was collected using a proforma and data analysed using SPSS 20. A total of 337 women had ectopic pregnancy. Mean age was 29.8 +/-5.6 years and majority (82.2%) were married. Identified risk factors were previous abdominal/pelvic surgery (ies), ectopic pregnancy and abortions while common clinical features include abdominal pain, vaginal bleeding and amenorrhoea. Majority (76.6%) were ruptured while ampulla of the fallopian tube was the commonest site. EP is still a dare emergency in our environment with most women presenting after it has ruptured. However, the risk factors and presentation has not changed.

Keywords: *ectopic pregnancy, risk factors, presentation, trend.*

GJMR-E Classification: *NLMC Code: WQ 300*



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A 10 Year Review of Ectopic Pregnancy in University College Hospital, Ibadan, Nigeria

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I. Introduction

Ectopic pregnancy (EP) is defined as a pregnancy in which the implantation of the embryo occurs outside the uterine cavity, most frequently in one of the two fallopian tubes or, more rarely, in the abdominal cavity. EP is the leading cause of maternal mortality in industrialized countries in the first three months of pregnancy, and possibly the second most frequent cause in developing countries after abortion complications [1, 2, 3].It is a major health problem for women of childbearing age not only because it causes maternal mortality but of greater clinical importance is the indirect morbidity of poor fertility prognosis and adverse outcome in subsequent pregnancies with a 7-15% chance of recurrence and only 40-60% chance of conceiving after surgery [4,5].

It is a common life-threatening emergency in the developing world with high burden and its frequency is still high[6].The risk of death among those in the developed world is between 0.1 and 0.3 per cent while in the developing world it is between 1 and 3% [7]. Between 93 and 97% of ectopic pregnancies are located in a fallopian tube and 75% are located in the ampulla,13% in the isthmus and 12% in the fimbriae [8].

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The incidence of ectopic pregnancy varies from country to country and within the same country, it varies from one community to another. There is currently an increased incidence of ectopic pregnancy globally due to higher incidence of salpingitis, inadequate treatment for pelvic inflammatory disease, use of intrauterine contraceptive device, increase in surgical procedures for tubal disease and improved diagnostic technique[9]. Several factors have been shown to increase the risk of ectopic pregnancy. These risk factors have the same mechanism of action with affectation of the ciliary functions of fallopian tube with pelvic inflammatory disease as the most common[10,11]. Other reported aetiological factors include previous ectopic pregnancy, endometriosis, previous tubal surgery, infertility and infertility treatments, previous caesarean sections, tubal spasm, and congenital defects of the fallopian tube [12, 13]. However, multiple factors have been shown to contribute to the relative risk of ectopic pregnancy although some patients may not have any risk factor. Behavioural and clinical risk factors include early sexual debut, multiple lifetime sexual partners, lack of condom use, miscarriage and induced abortion[14].

Up to 10% of women with ectopic pregnancy have no symptoms, and one-third have no medical signs [15].Signs and symptoms of ectopic pregnancy include increased human chorionic gonadotrophin, vaginal bleeding (in varying amounts), sudden lower abdominal pain, pelvic pain, a tender cervix, an adnexal mass or adnexal tenderness. In the absence of ultrasound or human chorionic gonadotrophin assessment, heavy vaginal bleeding may lead to a misdiagnosis of miscarriage. Nausea, vomiting and diarrhea are more rare symptoms of ectopic pregnancy. Also abdominal distension, tenderness, peritonism and hypovolemic shock are not uncommon symptoms when the ectopic pregnancy ruptures[7].

This study is a ten year review conducted to determine the risk factors for ectopic pregnancy among patients presenting at a tertiary hospital in South Western Nigeria.

II. Methodology

This was a retrospective study carried out in the department of Obstetrics and Gynaecology, University College Hospital (UCH). This hospital provides care at tertiary level. UCH is one of the largest teaching hospitals in Nigeria. The case records of all the patients

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with ectopic pregnancy who were managed at the University College Hospital (UCH) Ibadan during the study period were reviewed. All cases that were diagnosed and managed for ectopic pregnancy were included in the study. Information on socio-demographic characteristics, obstetric history, history of risk factors, clinical presentation on admission, and type of treatment offered was collected using a proforma. Data was entered and analysed using SPSS version 20. The results are presented in proportions and percentages.

III. Results

A total of 337 women were diagnosed and managed for ectopic pregnancy during the study period. Mean age was 29.8 +/- 5.6 years but ranged between 16 and 45 years with majority (34.1%) in the 26 to 30 years category. Higher proportions (82.2%) of them were married, a third (33.8%) were nulliparous women and about half (51.9%) of them had secondary level of education. Majority (57.3%) were self-employed (Table 1).

The presenting complaints varied extremely. Abdominal pain (80.1%), vaginal bleeding (49.9%) and amenorrhoea (28.2%) were the most frequent symptoms (Table 2).

Over the 10-year study period, the number of cases did not follow a regular pattern. The sixth year (2011) recorded the highest number of cases (58 patients) after which there was a consistent decrease in the number of cases with the lowest (13) in 2015 (Figure 1).

A large proportion of the patients (42.4%) in this study presented with past history of abortion. Previous contraceptive use and previous pelvic surgery were the other associated risk factors patients presented with in this study with 16.0% and 12.2% respectively. Among them 5.9% were intrauterine contraceptive device (IUCD) users and 4.5% were injectable users. The most commonly used method of contraception 5.9% was IUCD which is also an associated risk factor in this study. Only one patient was found to be a smoker (Table 3).

More than half (63.8%) of the patients had no documented site. The most documented site 11.3% of ectopic gestation was the ampullary region of the fallopian tube followed by the cornual (9.2%) while cervical region had the lowest occurrence (0.3%). More than half (57.9%) of the study population presented with the EP located in the right fallopian tube (Table 4). Majority (94.4%) of the cases were diagnosed through ultrasonography while 4.7% were through clinical physical examination only and 0.9% by laparoscopy. Among the 337 cases of ectopic pregnancies, the ruptured ectopic pregnancies accounted for 76.6%. This was followed by slow leaking 14.5% and only 8.9% were unruptured.

IV. Discussion

During the period of review, it was observed that there was a decrease in the incidence of ectopic pregnancy in UCH considering the last five years of the review. History of previous abortions, ectopic pregnancy, infertility, pelvic surgery, pelvic inflammatory disease, contraceptive use and tobacco use were the risk factors of EP identified in this study.

The peak age incidence was amongst women in the age group of 26-30 years which corroborates with findings of Panti et al. [16], Udigwe et al. [17] and Etuknwaet al.[18]. This was not surprising, considering that this is the reproductive age group and high risky sexual behaviour is common in this age group.

The highest incidence of ectopic pregnancy was noted amongst nulliparous women, which was in conformity with findings from some other Nigerian studies [19,20]. This may be because most young unmarried people with unintended pregnancies often procure unsafe abortions, which subsequently predisposes them to having an ectopic gestation in future pregnancies or the relatively high incidence of EP among nulliparous may be explained by the increased use of fertility drugs (ovulation induction drugs) which are becoming a recognizable risk factor [21].

This study identified previous histories of infertility, abortions, abdominal/pelvic surgery, ectopic pregnancy, pelvic inflammatory disease, contraceptive use, tobacco use as risk factors of ectopic pregnancy. It was observed that most of the cases of ectopic pregnancy had more than one risk factor. A previous history of abortion and contraceptive use were major risk factors. The study also revealed that majority of the patients were not using any form of contraception at the time of the ectopic pregnancy and this substantiates Panti et al. findings on women with ectopic pregnancy[16]. However, if a woman who is using intrauterine contraceptive device (IUCD) becomes pregnant, the chances of that pregnancy being ectopic are increased. This is because it is thought that IUD reduces intrauterine gestations by 99.5% and increases tubal implantation by 95%, thus accounting for the relative increase in tubal pregnancies in IUCD users. Also, the use of intrauterine contraceptive device increases the risk of developing an ectopic pregnancy almost four fold [14].

One of the risk factors of EP in this study was previous history of an ectopic pregnancy. This finding corresponds with that of Jurkovic who reported that every woman with a previous ectopic pregnancy would be at a high risk of recurrence of another ectopic pregnancy[22]. The presenting symptoms, such as abdominal pain, vaginal bleeding and amenorrhoea, observed in this study agree with those reported by other researchers [23]. This is because most of ectopic pregnancy had ruptured at the time of presentation,

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hence majority of these patient were haemodynamically compromised. This makes the condition a dare emergency with resuscitation and treatment effected immediately in other to save the woman's life.

In conclusion, this study revealed a decrease in the frequency of ectopic pregnancy in the more recent years in the South Western Nigeria as opposed to a rising incidence of ectopic pregnancy worldwide. However, the risk factors and presentation has not changed.

Table 1: Socio-demographic characteristics

Variable	Frequency (N=337)	Percentage (%)
Age		
16-20	16	4.7
21-25	62	18.4
26-30	115	34.1
31-35	90	26.7
36-40	44	13.1
≥41	10	3.0
Marital status		
Married.	277	82.2
Single	59	17.5
Divorced.	1	0.3
Level of education		
Primary or lower.	31	9.2
Secondary.	175	51.9
Tertiary or higher.	131	38.9
Occupation	68	20.2
Civil servant.	193	57.3
Self employed	20	5.9
Unemployed	56	16.6
Students.		
Parity.		
0	114	33.8
1	67	19.9
2	64	19.0
3	53	15.7
4	21	6.2
≥5	18	5.3
Total		

Table 2: Clinical presentation

Symptoms	Number of patients	Percentage (%)
Bleeding per vagina	168	49.9
Abdominal pain	270	80.1
Amenorrhoea	95	28.2
Abdominal tenderness	3	0.9
Shock	6	1.8
Fainting/collapse	20	5.9
Dizziness/weakness	23	6.8
Nausea/vomiting	7	2.1

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Table 3: Identifiable risks factors among the study population

Risk factors	Frequency	Percentage
Previous infertility	8	2.4
Previous abortions	143	42.4
Previous abdominal/pelvic surgery	41	12.2
Previous ectopic pregnancy	8	2.4
Previous PID infection	5	0.3
Previous contraceptive use	54	16.0
Tobacco use	1	0.3

Table 4: Site of ectopic pregnancy

Site	Frequency	Percentage (%)
Undocumented site	215	63.8
Fallopian tube -Left. -Right	 142 195	 42.1 57.9
Cornua	31	9.2
Isthmus	15	4.5
Ampullary	38	11.3
Fimbriae	13	3.9
Cervical	1	0.3
Ovarian	21	6.2
Interstitial	3	0.9



Figure 1: Ten-year trend of ectopic pregnancy in UCH

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Laparoscopic Resection Verses Transvaginal Resection in the Management of Exogenous Cesarean Scar Pregnancy

By Lilian Onwonga
Nanjing Medical University

Abstract- *Background:* Caesarean scar pregnancy (CSP) is a rare but potentially life-threatening complication for women of reproductive age with a previous caesarean birth the incidence of CSP has exponentially risen over the past two decades, due to an increasing rate of caesarean delivery. Because of the rarity of the condition, the majority of CSPs are case reports or small case series reported in the literature, and no universal treatment guidelines has been established yet.

Objective: To compare the safety and efficacy of laparoscopic resection and transvaginal resection as treatment options for cesarean scar pregnancy (CSP).

Methods: The clinical data of 19 patients diagnosed with exogenous CSP from January 2013 to June 2017 was reviewed.

Keywords: *exogenous caesarean scar pregnancy, laparoscopic resection, transvaginal resection.*

GJMR-E Classification: *NLMC Code: WJ 190*



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Objective: To compare the safety and efficacy of laparoscopic resection and transvaginal resection as treatment options for cesarean scar pregnancy (CSP).

Methods: The clinical data of 19 patients diagnosed with exogenous CSP from January 2013 to June 2017 was reviewed.

Setting: Tertiary hospital.

Results: Among these patients, 16 patients were treated with laparoscopic resection, 3 patients with transvaginal resection. All patients recovered fully without complications. Patients with excessive vaginal bleeding underwent emergency UAE treatment before laparoscopy. These two treatments had similar success rates (100% vs.100%), with no statistically significant difference in the intraoperative blood loss, duration of hospital stay, time for resolution of CSP mass, time for the return of menstruation, and time for normalization of serum beta HCG levels.

Conclusions: The accurate and timely diagnosis of CSP is vital. Laparoscopic resection and transvaginal resection of CSP are a safe and effective method of treatment, and both have comparable outcomes, high success rate, and fewer complications.

Keywords: exogenous caesarean scar pregnancy, laparoscopic resection, transvaginal resection.

I. Introduction

Caesarean scar pregnancy(CSP) or caesarean scar ectopic pregnancy is a rare but potentially life-threatening type of ectopic pregnancy where the gestational sac implants in a previous caesarean scar. The first case of CSP was described by Larsen and Solomon in 1978.[1] The incidence of CSP being reported over the past two decade has increased exponentially and is expected to rise due to the increasing rates of caesarean section (CS) being high as 40-50% and some hospitals up to 70%. [2] The Estimated incidence of CSP is 1:1800-1:2,226 in all Pregnancies, 0.45% in pregnancy after caesarean performed worldwide, improved diagnostic techniques and increased physician awareness. The frequency of CS worldwide is about 15%, but in China the rate is as delivery, and 6.1% in ectopic pregnancy after caesarean delivery.[3] Early and timely diagnosis is mandatory to prevent life-threatening complications like uterine rupture, massive haemorrhage or other serious consequences.

Vial et al. [4] classified CSP into two subtypes based on findings on transvaginal sonographic imaging. Endogenous CSP (CSP type I) is characterized by the implantation of the gestational sac at the cesarean-scar site followed by inward growth towards either the cervical isthmus space or the uterine cavity. Exogenous CSP (CSP type II) results from the deep implantation of the gestational sac into a cesarean scar defect with an outward growth that infiltrates the uterine myometrium creating a bulge from the uterine serosal layer.

Our study retrospectively analyzed the clinical data of 19 patients with exogenous CSP (type II CSP) treated in our hospital in the past five years. We analyzed and compared the outcomes, safety and efficacy of laparoscopic resection and transvaginal resection of exogenous CSP by evaluating the intraoperative blood loss, the time for serum beta-human chorionic gonadotropin (beta-HCG) to return to normal, duration of hospital stay, and resolution of the mass and return of menstruation.

II. Materials and Methods

a) Patients

A retrospective comparative study was adopted. Between January 2013 and June 2017, 19 patients with exogenous CSP admitted at First Affiliated Hospital of Nanjing Medical University were enrolled in this study. The inclusion criteria were; (1)a history of cesarean delivery; (2) a history of amenorrhea and a positive urine pregnancy test; (3) a color Doppler transvaginal ultrasound indicating a Cesarean scar pregnancy based on the diagnostic criteria stipulated by Godwin et al.[5];*(i)*.Empty uterus and cervical canal; *(ii)*. Development of the gestational sac or fetal pole with or without cardiac activity or identification of a mixed-echo

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mass in the anterior part of the caesarean scar;(*iii).*Very thin myometrium(1-3mm) or an absence of healthy myometrium between the bladder wall and the sac/mass; and *(iv).*The gestational sac or mixed-echo mass being located toward either the cervicoisthmic space or the uterine cavity in CSP-I, or the infiltration of the gestational sac or mixed-echo mass into the myometrium and/or forming a bulge from the uterine serial layer in CSP-II; (*v*). High velocity with low impedance peritrophoblastic vascular flow clearly surrounding the sac in Doppler examination; (4) postoperative pathology report indicating implantation or the presence of chorionic villi in the myometrium; (5) Patient not a referral from a peripheral facility due to failed treatment for CSP.

This study was approved by the ethics committee of First Affiliated Hospital of Nanjing Medical University. All patients in this study were thoroughly informed of the potential risks and complication, benefits and curative effects of the surgeries and other alternatives and signed a written consent. The 16 patients were managed by laparoscopic resection of the CSP while 3 patients who declined laparoscopic surgery were managed by the transvaginal approach.

b) Preoperative Evaluation

Data collected from all patients included maternal age, presenting symptoms, gravidity, parity, gestational age based on last menstrual period (LMP) or Ultrasound dating, number of previous Caesarean deliveries, the time interval between the last caesarean delivery and current CSP, initial preoperative serum β-HCG, and transvaginal ultrasound findings (size of gestational sac/mass, relationship with anterior uterine myometrium, presence or absence of cardiac activity). Routine preoperative preparations were done, complete blood cell count, liver and renal function test, urinalysis, coagulation panel, and electrocardiography (ECG) were performed to rule out any contraindication for surgery. Vaginal cleaning was done a day before surgery.

c) Surgical Methods

i. *Laparoscopic resection*

The patients assumed a lithotomic position, under general anesthesia. The operation field was sterilized, CO2 pneumoperitoneum was created conventionally, a laparoscope was inserted to visualize the anterior wall of the uterus, the bladder, and for the presence of adhesion. Adhesiolysis was performed, the peritoneum between the bladder and the uterus was dissected, and the bladder pushed downwards appropriately, bilateral occlusion of ascending branches of uterine arteries was performed. Under laparoscopic monitoring the pregnancy mass was suctioned till it significantly reduced in volume, then the lesion and the scar tissue which is distinguishable from normal myometrium of the uterus was excised. The uterine defect was closed up in two layers using continuous sutures, and hemostatis was achieved. The uterine artery occlusion was the relieved to restore uterine blood flow. An abdominal drainage tube was left in situ. Hysteroscopy was then done to visualize the uterine cavity, the scar site and the patency of fallopian tube osmium. The operation was completed and patients reversed from anaesthesia.

ii. *Transvaginal resection*

Patients were placed in a lithotomic position then put under general anesthesia. The operation field was cleaned and draped. The bladder was emptied using a metal catheter. The vagina and cervix were exposed using a vaginal retractor. The anterior vaginal fornix was exposed by tenaculum attached to the upper lip of the cervix and pulled downwards. Normal saline was injected into the cervicovaginal space. The pressure from the injected solution separated the bladder and cervix. A transverse incision was made 2 cm above to the clamped site; the bladder was dissected and pushed away through the cervicovaginal gap till vesicoperitoneal fold, where the peritoneum was punctured and a vaginal retractor placed. A boggy area was detected by a probe and considered as a scar pregnancy lesion. A transverse incision was made at the cesarean section scar, where a bulge and purple bluish discoloration associated with pregnancy tissue could be visualized; sometime villi could be visualized as well. The scar tissue and the pregnancy tissues were removed using an ovum forceps through the incision, followed by suction to evacuate the uterine cavity. The incision was then closed in two layers by a continuous lock stitch under the guidance of the detecting probe. After examining the bladder to rule out any trauma during surgery, the peritoneum was sutured to ensure there was no active bleeding. Finally, the vaginal wall was closed by a continuous locking suture, 3 pieces of iodine gauzes were left in situ to be removed 24 hours later after the surgery. In both the laparoscopic or transvaginal groups, an indwelling urine catheter was put to monitor urine output and was removed 48 hours postoperatively.

Successful treatment was regarded as a patient fully recovered, a steady decline in vaginal bleeding, serum beta HCG levels returning down to normal, the disappearance of the CSP mass, no severe complications, uterus preserved, and no need for additional treatment. Intraoperative blood loss, length of hospital stay, serum beta-HCG levels, and postoperative complication were recorded.

iii. *Follow up*

Patients were discharged based on the following criteria: no chief complaint, no fever, the vaginal bleeding stopped or decreased to less than normal menstrual bleeding, normal or steadily decline of beta HCG level, no CSP mass on transvaginal

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ultrasound or the size of mass decreased. After discharge from the hospital, all patients were followed up every week for 3 to 6 months. Serial measurements of serum beta HCG was done every week till normal. The first return of the menstrual cycle was recorded. Transvaginal ultrasound screening was carried out to determine if there were residual pregnant tissues within the uterine scar tissues every two weeks.

The patients were advised to take on a suitable method of contraception for at least one year.

iv. *Statistical Methods*

We used SPSS 24.0 software for statistical analysis of the data. All data are represented as mean ±standard deviation (SD). The independent sample t-test was used for intergroup comparison. A p value ($P<0.05$) was considered statistically significant.

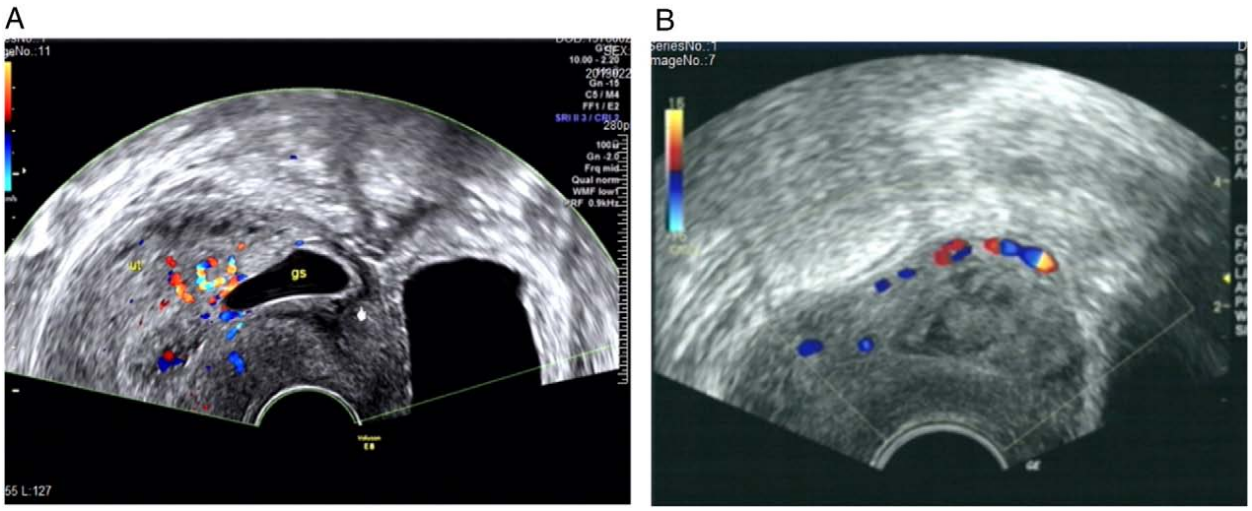


Fig. 1: Transvaginal ultrasonography images. (a) A 34-year-old woman with endogenous cesarean scar pregnancy t; a gestational sac is implanted at the site of a previous cesarean scar. (b) A 28-year-old woman with exogenous cesarean scar pregnancy type; the gestational sac implanted into a previous cesarean scar defect with outward growth that has infiltrated into the myometrium and bulges from the uterine serial surface.

III. Results

From January 2013 to June 2017, 19 patients diagnosed with exogenous CSP were managed in our gynecology ward. During the same period, 212 cases of Endogenous CSP were admitted in our hospital. The clinical characteristics of the patients according to the type of surgery are provided in Table 1. All the patients had a history of low-segment cesarean deliveries, and their ages ranged from 22-44years (33.05±6.20years) .3 patients had a history of 2 Cesarean deliveries while the rest of the 16 had one prior cesarean delivery. The preoperative serum beta HCG level was 710–156,452 IU/L. The interval between the last caesarean delivery and current CSP was 5.94±4.03 years (0.7-22years), 6 cases had a fetal cardiac activity present on ultrasound. The thickness of the myometrium from the serosa to the gestational sac, as measured on ultrasound was 1.0mm-5.0mm, and the largest diameter ranged from 10mm-40mm

Of the 19 patients with an exogenous CSP, 3 received Transvaginal resection of the CSP with the operation completed successfully. For the other 16 patients, we conducted laparoscopic resection, 4 patients received bilateral uterine artery remobilization before surgery due to a large amount of vaginal bleeding on admission. All were successful, and none of them required secondary treatment.

The postoperative Transvaginal color Doppler ultrasound reexaminations did not reveal any significant mass at the uterine isthmus. For both groups the intraoperative blood loss, the duration of hospital stay, the time for the serum beta HCG to return to normal, time for complete resolution of CSP mass and resumption of menstruation between the two groups showed no statistically significant difference ($P>0.05$). (Table 2). The pathological report of the lesion tissues taken from the 19 patients revealed chorionic villi in the myometrium, consistent with the preoperative diagnosis of CSP. The success rate in both groups was 100% with no postoperative complication.

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Table 1: Clinical characteristics of patients with cesarean scar pregnancy at baseline [χ]

Characteristics	laparoscopic group	Transvaginal group	P value [ɣ]
Maternal age (years)	33.23±5.07	33.03±5.00	0.993
Gravidity	4.01±1.5	4.10±1.48	0.509
Abortion	1.74±1.38	1.90± 1.40	0.387
Gestational age (days)	49.25±5.59	44.67±6.11	0.2149
Number of previous cesarean deliveries			
1	13	3	
2	3	0	
Time interval between previous CS and present CSP (years)	5.92±3.71	6.33±4.23	0.467
Initial level of serum β-HCG (IU/L)	44995±41966	43211±42751	0.389
Largest diameter of CSP mass (mm)	27.87±13.76	29.01±14.09	0.285

Abbreviations: CSP, cesarean scar pregnancy; CS, cesarean sections; β-HCG, beta human chorionic gonadotropin..
[χ] Data presented as mean ± SD (range) or number (percentage) unless indicated otherwise
[ɣ] Student t test

Table 2: Patients outcome after treatment[χ]

Variable	LAP group (n=16)	TV group (n=3)	P value[ɣ]
Intraoperative blood loss (ml)	159.38±155.54	76.67±40.41	0.3829
Percentage decline of β-HCG in 24 hrs after treatment	85.04±11.21	82.47±21.27 %	0.3379
Duration of hospital stay (days)	9.56±2.83	7.67±1.15	0.2274
Time for resolution of CSP mass (days)	24.50±1.32	24.00± 1.00	0.5440
Time for normalization of serum β-HCG (days)	19.25 ±1.34	17.33.±3.06	0.085
Time for resumption of menstruation (days)	24.76±1.87	25.56±1.52	0.4971
Success rate of treatment (%)	100%	100%	

Abbreviations: CSP, cesarean scar pregnancy; β-HCG, beta human chorionic gonadotropin.
[χ] Data is given as mean ± SD (range) or percentage unless indicated otherwise
[ɣ] Student t test

IV. Discussion

In 1978, Larsen and Solomon first reported one case of scar pregnancy and proposed the concept of scar pregnancy after caesarean section. [1]Until 2001, there were 19 cases of scar pregnancy reported in 2 case reports and by 2011 the number of cases described in the literature was 751, showing a rapid increase in the incidence of this type of pregnancy which can be attributed to the increasing number of caesarean deliveries being done, improved diagnostic tools and increased physician knowledge and awareness of the condition. [6]. Due to the relatively lower incidence, there has been no universal standard method of treatment of CSP. Classification using ultrasonography provided the basis for the management of patients.

The exact etiology of CSP is unknown but it has been suggested that a shortage of blood supply at a low uterine segment after cesarean delivery may result in insufficient fibrosis and repair hence forming uterine scar dehiscence or small-scar defects and later CSPs.[7] Such defects can also develop from the trauma of other uterine surgery for such as curettage, myomectomy, metroplasty, hysteroscopy and even manual removal of placenta. [8,9] Better suturing techniques of the cesarean incision may help prevent CSP.

CSP can occur in any woman of child bearing age with a previous caesarean delivery. The age reported in literature ranges between 20-45 years old, and the gestational age at presentation is 5-16 weeks. [3,9] In this study the age of the 19 patients was 22-44years old, and the gestational age was 4-14 weeks, which is consistent with literature. No positive correlation between the number of Caesarean sections and the risk of CSP has been shown. Rotas et al reviewed 112 cases of which 52% had a history of one CS, 36% had a history of 2 CS, 12% had 3 or more previous CS, suggesting that the number of previous is not related to the risk of CSP. [10] Our study found 16 patients (84.2%) had a history of 1 CS and 3 patients (15.8%) had 2 previous CS.

CSP often presents with symptoms of irregular vaginal bleeding and /or abdominal pain or discomfort, but a few are asymptomatic and CSP is found incidentally on routine first trimester Ultrasound. A number of cases are misdiagnosed as a spontaneous abortion of an intrauterine pregnancy, or after medical abortion or curettage done for abnormal vaginal bleeding. In this study all patients had a history of amenorrhea, no cases were misdiagnosed, 52.6% of

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patients presented with irregular vaginal bleeding, 15.7% with both vaginal bleeding and abdominal pain, and 31.5% were asymptomatic. Routine transvaginal ultrasonography is therefore recommended in early pregnancy for patients who have previously undergone a cesarean delivery to rule out CSP.

The Transvaginal ultrasonography is the standard first line diagnostic tool with a diagnostic accuracy as high as 86.4% reported combined with detailed patient history. [10] The Ultrasound diagnosis criteria for endogenous CSP proposed includes an empty uterine cavity, empty cervical canal,, gestational sac seen at either the uterine isthmus or the anterior uterine wall, and myometrial tissue depression detected between the gestational sac and bladder wall. [4,5] Magnetic resonance imaging(MRI), hysteroscopy, or laparoscopy can be considered when ultrasound imaging is inconclusive or equivocal in order to reduce the misdiagnosis rate. It is notable that MRI is a costly diagnostic technique and that this must often be taken into account in clinical environment. Ultrasonography has the advantages of being non-invasive, simple, and cheap. [11,12,13] The pathological examination done in this study confirmed the accuracy of using ultrasonography for diagnosis.

Expectant management is not recommended as it is associated with poor outcome including hysterectomy.[14]The currently available therapeutic options reported in the literature include medical therapy such as injecting embyrocides(such as kalium chloratum) into the gestational sac, and systematic or local administration of methotrexate (MTX), uterine artery embolization (UAE), hysteroscopic resection, laparotomic resection, laparoscopic resection or more recently transvaginal resection.[6] Treatment should be individualized for every case of CSP after adequate preoperative assessment based on the gestational age, viability of fetus, myometrial defects, and presenting symptoms and physicians experience.

Surgical excision of CSP has the highest cure rate, and is not only effective in termination of pregnancy but also allows repair of scar defects while avoiding risk of hysterectomy caused by complications such as massive bleeding and uterine perforation during curettage and preserve fertility of the patient so as to avoid occurrence of repeat CSP. [15,16,} The gestational sac that grows toward the urinary bladder (exogenous CSP) has a higher risk for massive hemorrhage than the gestational sac that grows toward the uterine cavity (endogenous CSP). So for most patients in which the gestational sac grew toward the urinary bladder in most literature reports underwent surgical excision. Since the first report in 1978, laparotomy, laparoscopy, hysteroscopy or transvaginal excision of CSP and repair of the uterine defect have been reported successfully. After resection of CSP and repair of the scar through laparotomy, the serum beta HCG can be return to normal in 1-3 weeks after operation and it can reduce risk of uterus rupture and recurrence of CSP. However, laparotomy is associated with larger surgical wounds, long hospital stay and more postoperative pain and adhesion formation. It is usually used in emergencies in patients with unstable hemodynamic and actively bleeding.[3]

In recent years, with the development and improvement of minimally invasive technology, more physicians in China and abroad are using laparoscopic and transvaginal techniques in the treatment of CSP. Minimally invasive surgery has well established advantages of a smaller surgical wound, less postoperative pain, a shorter hospital stay, quicker recovery, and better aesthetic results.[16,17]

Since 2012, our hospital has taken the lead in exploring laparoscopy and transvaginal surgery in the province, 16 cases successfully treated with laparoscopy and 3 cases with transvaginal approach, the operations were smooth and intraoperative blood loss was minimal (159.38±155.54 and 76.67±40.41 respectively) and there were no postoperative complications. After the operation, the serum beta HCG decrease was satisfactory, minimal or no pregnancy tissue remained, and the results were satisfactory. However, laparoscopic surgery is expensive and is highly demanding for surgeons .Our experience is that:1.We should know the indications for operation: CSP patients with transvaginal colour Doppler ultrasound findings sgowing no gestational sac in the uterine cavity but the CSP mass bulging externally at the anterior wall of the lower uterine segment <5mm from serous layer and the echo of the gestational sac in the anterior wall of the lower segment of uterus is rich in blood flow signals ; 2. Avoid instrumental manipulation of the uterine cavity before operation, so as to reduce massive bleeding caused by instrumentation; 3. Temporarily occluding the blood flow of both uterine arteries, so as to reduce blood supply to the lesion and hence reducing massive bleeding during the operation.

Some studies have used mifepristone administered preoperatively in order to reduce intraoperative blood loss and enhance apoptosis and necrosis of the trophocytes or intraoperative local injection of oxytocin or injection of vasopressin with satisfactory results.[15,16] ; 4. Open the vesico-uterine peritoneal fold, push the bladder downwards to avoid both bladder injury during the surgical procedure and subsequent difficulties when suturing the uterine incision. Under laparoscopic monitoring, suction the pregnancy mass till it has significantly reduced in volume, then the lesion and the scar tissue which is clearly distinguishable from normal myometrium of uterus is excised; 5. The uterus should be sutured in two layers so as to prevent recurrence of CSP and preserve reproductive function; 6. After resection and repair of scar lesions, the uterine artery occlusion is relieved,

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uterine blood flow is restored, and uterine function preserved.

Transvaginal approach is relatively simple in experienced hands .However there are limitation in gestation age, amount of bleeding, gestational sac location, difficulty in cervical exposure and a small operation field.[17].Our experience is; 1. The gestational age <90days, the gestational sac diameter<5cm, <5mm from the serosal layer, the position of the gestational sac is low and the cervix is easily exposed; 2. Intraoperative injection of oxytocin into the cervix helps reduce bleeding during the operation: 3. Normal saline is injected into the cervico-vaginal gap, the pressure from the injected normal saline fully separates the bladder and cervix; 5. The incision is closed by a continuous locking stitch under the guidance of the detecting probe, carefully repairing the anterior wall of the uterus, to avoid scar incision diverticulum and small sinus formation.

Our study was limited by the sample size and the lack of multicenter data, and lack of follow up on future reproductive outcomes. In the future, we will conduct a prospective, randomized, controlled study with more patients to make up for these deficiencies.

V. Conclusion

For patients with CSP is early, timely, and clear diagnosis is key, and individualized treatment that should be implemented in accordance with the gestational age, hemodynamic stability of the patient, serum beta HCG levels, and ultrasound and MRI findings. Laparoscopic resection and transvaginal resection are the most reasonable approach for managing exogenous CSP because of the deep implantation of the mass into the myometrium and very thin myometrium between the gestational sac and the bladder, hence high risk of rupture with other treatment modalities. They both have a comparable high success rate, thorough lesion clearance, fewer complications, and a shorter time to beta HCG levels returning to normal. However, both require accumulated patient experiences and surgical techniques are necessary before broad application.

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Conflict of interest
None.

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Satisfaction and Associated Factors among Mothers Delivered at Abrade Swede Memorial Primary Hospital, Bore, and West Gojjam, Amharic, Ethiopia: A Cross Sectional Study

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Abstract- *Introduction:* Maternal satisfaction is a means of evaluating quality of maternal health care given in health facilities. The objective was to assess the level of maternal Satisfaction and associated factors at Abrade Swede Memorial Primary Hospital.

Method: Cross-sectional study was conducted on 420 clients by systematic sampling method from February 8, 2017 to September 25, 2017. Structured questionnaire that was prepared by Ethiopian Federal Ministry of Health was used. Pre-testing was done prior to the actual data collection process on a sample of 20 respondents and modified accordingly. The study was approved by Abrade Swede Memorial Primary Hospital Senior Management Committee. The collected data were checked for completeness and consistency before being coded, entered and analyzed using SPSS version 16. Logistic regression was used to assess the presence of association between dependent and independent variables using SPSS at 95% CI and 5% margin of error.

Keywords: *maternal satisfaction, associated factors, delivery, west gojjam zone, ethiopia.*

GJMR-E Classification: *NLMC Code: WQ 400*



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Satisfaction and Associated Factors among Mothers Delivered at Abrade Swede Memorial Primary Hospital, Bore, and West Gojjam, Amharic, Ethiopia: A Cross Sectional Study

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Result: The study revealed that level of satisfaction among delivering mothers was 88%. Educational level (AOR = 2.15, 95% CI = [1.02-3.71], access to ambulance service (AOR=3.15, 95% CI=[1.02-3.78], respect full delivery service (AOR=6.85, 95%CI=[4.35-6.95], welcoming hospital environment (AOR=3.09 , 95% CI = [2.30-2.69] , proper labor pain management (AOR=4.51, (95% CI=(3.12-5.01) and listening to their questions [AOR=3.95, 95%CI [2.35-4.36] were independent predictors for maternal satisfaction.

Conclusion and Recommendation: Even though most of the participants were satisfied, they still had unmet needs and expectations in the delivery service provider. The identified main determinants were level of education, access to ambulance service, welcoming Hospital environment, proper pain management and listening to their questions. Therefore, there is a need to improve the care given to maternity and appropriate strategy should be designed to address the unmet needs of mothers delivered in the hospital.

Keywords: maternal satisfaction, associated factors, delivery, west gojjam zone, ethiopia.

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I. Introduction

Globally, about 800 women die from pregnancy or labor related complications around the world every day. Two hundred eighty-seven thousand women died during pregnancy and childbirth in 2010; more than half of these deaths occur in Africa. The ratio of maternal mortality in the Sub-Saharan Africa region is one of the highest, reaching 686 per 100,000 live births [1]. In Ethiopia, according to 2016EDHS, the estimated maternal mortality ratio was found to be 412 per 100,000 live births [2].

The existence of maternal health service alone does not guarantee their use by women [3]. The World Health Organization promotes skilled attendance at every birth to reduce maternal mortality and recommends that women's satisfaction be assessed to improve the quality and effectiveness of health care [4]. Client satisfaction is a subjective and dynamic perception of the extent to which the expected health care is received [5]. It is not important whether the patient is right or wrong, but what is important is how the patient feels [6].

Studies done in Dhaka, Bangladesh, and South Australia showed that the level of maternal satisfaction with delivery care was 92.3% and 86.1%, respectively [7,8]. However, the level of satisfaction among laboring mothers in African countries is not enough; only 51.9% and 56% of mothers were satisfied with delivery services in South Africa and Kenya, respectively [9,10]. Ethiopian studies done in Amharic Referral Hospitals and Azuela Hospital revealed 61.9% and 80.7% satisfaction of mothers on delivery services, respectively [11,12].

Satisfaction with delivery service is a multidimensional construct embracing satisfaction with self (personal control), and with the physical environment of delivery ward and quality of care [13]. The mother's satisfaction during the birthing process is the most frequently reported indicators in the evaluation of the quality of maternity services [14]. Dimensions of care that may influence client satisfaction include: Health care Provider client interaction, Service provision,

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physical environment, access, bureaucracy and attention to psychosocial problems.

Many factors influence women's satisfaction during delivery: certain demographic characteristics have been predominantly studied in relation to satisfaction during delivery services. For example, a study done in Sweden (n=2762) reported that younger women had more negative expectations related to childbirth and they experienced more pain and lack of control during labor compared with older women [15], while another study done in Brazil (n = 15,688) showed no age related difference in women's satisfaction with childbirth services [16]. Studies from developing countries show that satisfaction with services had a negative association with the amount of time women spent at the health facility before childbirth [17]. The educational level of women in different studies and settings has demonstrated positive, negative or nil association with satisfaction during delivery services [18, 19]. Other identified factors that influenced satisfaction with childbirth services are: having clean and orderly labor rooms and women-friendly delivery processes, such as having been prepared in advance for what to expect during the labor/postpartum/breast feeding period; involvement in the decision-making process; having a birth plan and being able to follow it; having pain relief during labor; having a birth companion and respectful care providers; receiving help from care providers in performing self and neonate 'scare; and experiencing less symptoms in the postpartum period [20–25]. A woman's obstetric history, mode of delivery, and her feelings towards recent childbirth can also affect maternal satisfaction. For example: being multifarious, preferring a spontaneous vaginal delivery and being able to have a spontaneous vaginal birth [26, 27] enhances the women's satisfaction with giving birth.

Qualitative studies on Indian women's experiences and opinions on giving birth at a health facility reveal that they are not fully satisfied during delivery service, primarily due to the long waiting time before they meet a healthcare provider, having few opportunities to communicate with providers, not being involved in decision-making, and having stern care providers [28-32]; however, they settle for childbirth services perceived as 'essential' for safe childbirth rather than 'desirable' for a pleasant experience [33-36]. While the community's access to institutional delivery has improved, the assumption that accessibility is synonymous with quality of care, especially among policymakers, gives concern. This study aimed to assess women's satisfaction with an institutional delivery service using a standardized scale with intent to potentially use the findings in advocacy for service improvement.

Studying the quality of institutional delivery service from client perspective will provide systematic information for service providers, decision makers, local planners and other stakeholders help understand to what extent the service is functioning according to clients' perception, and what changes might be required to meet clients' need as well as to increase utilization of the service by the target population. This study serves both knowledge generation and delivery service quality improvement purpose. The findings of this study can be used by local planners and decision makers to improve the quality of institutional delivery service.

II. Methods

a) Study Design and Period

Cross-sectional study was conducted at Abrade Swede Memorial Primary hospital, from February 8, 2017 to September 25, 2017.

b) Study Area

Abrade Swede Memorial primary Hospital is found in Brevity administration 410 kilometers away from Addis Ababa and 155kilometers away from Bahia Dar the capital city of Amharic regional state. The hospital primarily serves for four worked as: Bore, Bore city, Shindig and Shekel.

c) Population

i. *Source Population*

All mothers delivered at Abrade Swede Memorial Primary Hospital from February 8,2017 to September 25,2017.

ii. *Study Population*

Those systematically selected mothers who delivered at Abrade Swede Memorial Primary Hospital from February 8, 2017 to September 25, 2017.

d) Inclusion & Exclusion Criteria

i. *Inclusion Criteria*

Mothers who delivered at Abrade Swede Memorial Primary Hospital from February 8, 2017 to September 25, 2017 before discharge.

ii. *Exclusion Criteria*

Mothers who delivered at Abrade Swede Memorial Primary Hospital and came for postnatal care were excluded to avoid recall bias.

e) Variables

i. *Dependent Variable*

Satisfaction

ii. *Independent Variables*

Socio Demographic Characteristics of the Respondents
Interaction with Healthcare Provider
Physical facilities
Service provision

iii. *Sample Size Determination and Sampling Procedure*

Targeted groups of clients in this study were delivery attendants. The sample size was determined by

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using a single population proportion formula, which took the proportion of overall satisfaction at 65.2% % [6], with a margin of error of 0.05 at the 95% confidence interval (CI). Adding 10% non-response rate, the final sample size was calculated to be 420 patients. From the hospital pervious report about delivery, average number of clients who delivered in the hospital was 110 per month. Therefore the number of participants who visited the hospital was estimated for the study period; then sampling fraction for selecting the study participants was determined by dividing with the total estimated number of patients during the data collection period to the total sample size which was calculated to be two. The first study participant was selected by lottery method among the list from one to five; the next study participant was identified systematically in every two intervals until the required sample size was achieved.

f) Data Collection Procedure and Quality Assurance

A validated structured questionnaire prepared by the Ethiopian Ministry of Health to assess maternal satisfaction was used according to the objectives of the study and the local situation of the study area in Amharic language. Then the questionnaire was translated to English to assure consistency of the tool. Pre-testing was conducted on 20 respondents at Bore Health center delivery attendants.

g) Data Management and Data Analysis

The collected data were checked for completeness and consistency before being coded, entered and analyzed using SPSS version 16. Summary statistics of socio demographic variables were presented using frequency tables. Bi-variable analysis was done and variables with p-value less than 0.2 were included in the multiple variable analysis of logistic regression. The odds ratio and 95% confidence intervals were also computed at p-value of 0.05.

h) Ethical Consideration

The research was approved by AsradeZewude Memorial Primary Hospital Senior Management Committee. Permission to conduct the study was also obtained from AsradeZewude Memorial hospital maternity case team. During data collection, the purpose of the study was clearly explained to the participants, and informed oral consent was obtained. To ensure confidentiality and privacy no identity was linked to the questionnaire.

III. Result

a) Socio Demographic Characteristics of the Respondents

A total of 420 clients after delivery were involved in this study. As shown in **Table 1**, 60% of the respondents were between 15-24 years of age, 90% were married, 70% of the delivery was spontaneous, and 70% of clients came to hospital by ambulance.

Table 1: Socio demographic characteristics of respondents at AsradeZewude Memorial Primary Hospital, Bore, West Go jam, Amharic, Ethiopia, from February 8,2017 to September 25,2017 (N=420)

Variables	Categories	N	%
Age	15 - 24	252	60
	25 - 34	84	20
	35 - 44	63	15
	45-50	21	5
Marital status	Single	8	2
	Married	378	90
	Widowed	4	1
	Divorced/Separated	29	7
Education	Never attended school	168	40
	Primary and junior education	168	40
	High school education	42	10
	Diploma and above	42	10
Gravid(pregnancies)	1-3	374	89
	4-6	42	10
	7-9	4	1
	10-12	0	0
Previous Institutional delivery	Yes	126	30
	No	294	70
Means of delivery	Spontaneous vaginal delivery	294	70
	Caesarian section	84	20
	Instrumental	42	10

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Referral condition	Self referral	168	40
	Referred from health facility	252	60
b) Transport type	c) Ambulance	d) 294	e) 70
	Public transport	84	20
	Private	4	1
	On foot	38	9

b) Health care Provider-client interaction

The majority of participants **(Table 2)** agrees and strongly agrees to provider client interaction questionnaires.

Table 2: Maternal Satisfaction with interaction of health care provider at AsradeZewude Memorial Primary Hospital, Bore, West Go jam, Amharic, Ethiopia, from February 8,2017 to September 25,2017 (N=420)

Variables	Level of agreement				
	5 = SAG	4 = AG	3 = NAG	2 = DAG	1 = SDAG
The hospital is welcoming, starting from the gate	90%	10%	0	0	0
The care providers listen and answer all my questions during delivery	50%	20%	0	10%	20%
All the care given to me was with my consent during labor	90%	10%	0	0	0
The care I received was respect full	90%	10%	0	0	0
I was counseled about breast feeding, vaccination and others after delivery	60%	20%	10%	10%	0
The health care providers introduced themselves to me	70%	0	20%	10%	0
During labor and delivery my pain was properly managed	80%	14%	0%	0	6%

SAG =strongly agree, AG=agree, NAG =Not agree, DAG= disagree and SDAG=strongly disagree

c) Maternal satisfaction with physical facilities

Only 50% strongly agreed and 20% agreed that there was a functional Maternity ward toilet, hand washing and shower during their labor and delivery time (Table 3).

Table 3: Maternal Satisfaction with physical facilities at AsradeZewude Memorial Primary Hospital, Bore, West Go jam, Amharic, Ethiopia, from February 8,2017 to September 25,2017(N=420)

Variables	Level of agreement				
	5 = SAG	4 = AG	3 = NAG	2 = DAG	1 = SDAG
Getting the maternity unit is easy starting from the gate	90%	10%	0	0	0
Maternity ward toilets, hand washing and shower were functional during my labor and delivery	50%	20%	0	10%	20%
Cleanness of the ward was good during my labor and delivery	90%	10%	0	0	0
My privacy was secured during my labor and delivery	90%	10%	0	0	0
I used my preferred position during my labor and delivery	60%	20%	10%	10%	0
I was allowed to have my families on my side during my labor and delivery	70%	0	20%	10%	0

d) Maternal satisfaction with Service provision

The majority of participants (60% strongly agreed and 40% agreed) responds positively to the questionnaire 'I have got a bed immediately' (Table 4).

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Table 4: Maternal Satisfaction with Service provision at AsradZewude Memorial Primary Hospital, Bore, West Go jam, Amphora, Ethiopia, from February 8,2017 to September 25,2017 (N=420)

Variables	Level of agreement				
	5 = SAG	4 = AG	3 = NAG	2 = DAG	1 = SDAG
I was directed to the maternity ward immediately without recording and other procedures	90%	0	10%	0	0
I was seen by the care provider immediately I have got the maternity ward	90%	10%	0	0	0
I have got a bed immediately	60%	40%	0	0	0
All those diagnostic tests prescribed for me were available in the hospital	90%	10%	0	0	0
All those drugs and supplies needed were available in the hospital	90%	10%	0	0	0

e) Overall satisfaction

Overall satisfaction was measured on 10 scales, 1 worst and 10 the best. Those who scored 6 and above was considered 'yes' for satisfaction. Their intention to recommend others to the hospital was measured using yes (87%) and No (13%) options (Table 5).

Table 5: Overall Maternal Satisfaction at AsradeZewude Memorial Primary Hospital, Bore, West Go jam, Amharic, Ethiopia, from February 8,2017 to September 25,2017 (N=420)

	Yes	No
Those satisfied with the overall hospital service	88%	12%
Those who recommend others to this hospital	87%	13%

The regression output of factors for maternal satisfaction showed that mothers who think of the welcoming hospital environment was 3.09(2.30-2.69) times more likely to satisfy than those who perceive the hospital environment was not welcoming (Table 6).

Table 6: Maternal Satisfaction and associated factors at AsradeZewude Memorial Primary Hospital, Bore, West Go jam, Amphora, Ethiopia, from February 8,2017 to September 25,2017 (N=420)

Variables		Maternal satisfaction		COR(95%CI)	AOR(95%CI)
		Satisfied	Not satisfied		
level of Education	never educated	148(35%)	20(5%)	3.09 (1.34-7.14)	2.15(1.02-3.71)
	first level	148(35%)	20(5%)	2.01(1.00-3.02)	2.01(0.99-3.10)
	high school	37(9%)	5(1%)	1.99(1.00-2.03)	1.56(0.85-2.96)
	diploma and above	37(9%)	5(1%)	1	1
means of delivery	Natural	259(62%)	36(9%)	2.60 (1.15–5.89)	
	C/S	73(17%)	10(2%)	1.29 (0.53–3.10)	
	Instrumental	37(9%)	5(1%)	1	
Means of transportation	Ambulance	259(62%)	36(9%)	2.99(2.50-3.66)	3.15(1.02-3.78)
	Public transport	74(18%)	10(2%)	1.40(1.01-1.95)	2.01(0.99-3.19)
	Private or Contract	4(1%)	0	0.21 (0.05–0.90)	1.53(0.81-2.91)
	On foot	32(7%)	5(1%)	1	1
Previous institutional delivery	Yes	111(26%)	15(4%)	2.05(1.02-2.03)	
	No	259(62%)	35(8%)	1	
The hospital is welcoming starting from the gate	Yes	328(78%)	45(11%)	3.31(2.32-2.66)	3.09(2.30-2.69)**
	No	41(10%)	6(1%)	1	1
I was directed to the maternity ward immediately without recording and other procedures	Yes	331(80%)	45(11%)	1.99(0.99-1.05)	
	No	39(8%)	5(1%)	1	
The care I received was respect full	Yes	328(78%)	45(11%)	6.02(4.01-6.65)	6.85(4.35-6.95)**
	No	41(10%)	6(1%)	1	1
I was allowed to have my families on my side during my labor and delivery	Yes	328(78%)	45(11%)	0.95(0.52-0.99)	
	No	41(10%)	6(1%)	1	
I used my preferred position during my labor and delivery	Yes	328(78%)	45(11%)	0.58(0.15-0.60)	
	No	41(10%)	6(1%)	1	
Cleanness of the ward was good during my labor and delivery	Yes	328(78%)	46(11%)	4.01(3.02-4.99)	
	No	41(10%)	6(1%)	1	
Maternity ward toilet, hand washing and shower was functional during my labor and delivery	Yes	207(49%)	28(7%)	3.21(2.20-3.52)	3.21(2.20-3.52)
	No	163(39%)	22(5%)	1	1
During labor and delivery my pain was properly managed	Yes	328(78%)	45(11%)	5.51(3.56-5.91)	4.51(3.12-5.01)**
	No	41(10%)	6(1%)	1	1

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I was advised about breast feeding, vaccination and others after delivery	Yes	287(68%)	39(9%)	0.30(0.12-0.25)	
	No	83(20%)	11(3%)	1	
The health care providers introduced themselves to me	Yes	127(30%)	17(4%)	0.31(0.25-0.39)	
	No	242(58%)	34(8%)	1	
The care providers listen and answer all my questions during delivery	Yes	328(78%)	45(11%)	3.61(2.95-4.62)	3.95(2.35-4.36)
	No	41(10%)	6(1%)	1	1

***p-value less than 0.001.*

IV. Discussion

In this study, the overall satisfaction of mothers on delivery service was found to be 88%, which was comparable to the study conducted in Wolayita Zone (82.9%), Debremarkos town (81.7%) and Azuela Hospital (80.7%) [9, 11, 17]. However, it was higher than the study, which was conducted in Jimmy (77%) [19] and Amphora Referral Hospitals (61.9%) [12] In Ethiopia and South Africa (51.9%) and Kenya (56%) in Africa [9,10]. The difference with the above finding may be because of a real difference in the quality of services provided, expectation of mothers or the type of health facilities.

Maternal educational status was significantly and inversely associated with their level of satisfaction with delivery services. Those respondents who were never educated were 2.15 more likely to satisfy with delivery service than whose educational level is diploma and above. This finding supports the study conducted in Azuela Hospital and other foreign literatures. The literatures showed that clients had various expectations about hospital delivery that influenced their perception of care [11, 18].

This study revealed that those who came to the hospital by ambulance were 3.15 times more likely to satisfy than those who came on foot. This finding was related to accessibility as explained by other similar studies [12, 24].

Maternal level of satisfaction was also related to creating welcoming environment hospital to laboring mothers. Those clients who consider the hospital as welcoming environment were 3.09 times more likely to satisfy with maternal service.

There was a strong association between maternal levels of satisfaction and respectful delivery care providers. Those participants who thought that care providers were respectful were 6.85 times more likely to satisfy with the delivery service. Perception of respondents of labor pain management was associated with level of maternal satisfaction. Those who answered yes were 4.51 times more likely to satisfy than who answered no to proper labor pain management, according to their perception. Attention to laboring mother's concern was also related to the maternal level of satisfaction. Those who thought their questions and concerns were answered during labor were 3.61 times more likely to satisfy than who thought not.

V. Conclusion

The aim of this study was to assess levels of maternal satisfaction and associated factors with delivery service at the AsradeZewude Memorial primary hospital. The overall maternal satisfaction with the delivery service was found to be 88%. Even though the result was slightly higher than the previous studies conducted in Ethiopia, there are still unmet needs and expectations of mothers during labor and delivery that the hospital should focus as delivery service quality improvement area. The identified associated factors were access to ambulance service, welcoming hospital environment, proper labor pain management, respectful care and listening to their questions.

VI. Recommendations

a) Recommendation to AsradeZewude Memorial primary Hospital

The hospital shall better consider physical barriers to create *a* welcoming hospital environment for maternal service.

The hospital should facilitate ambulance access for delivering mothers.

b) Recommendation to health care providers

The care providers should manage labor pain properly when providing service; it should be with compassionate and respectful.

The care provider should meet the social and psychological concerns of the delivering mothers.

c) Limitation

The feelings associated with childbirth itself, due to limited opportunities of exploration in quantitative studies, pose some confounders like the 'halo effect' a positive attitude towards successfully give birth makes it difficult to separate childbirth satisfaction from satisfaction with childbirth services. Participants' tendencies to rate services more positive in general are another known confounder. Participants' subjectivity being pleased with services that are not necessarily evidence based poses another confounder for quantitative studies measuring satisfaction.

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This study was not funded by any agency, but the motivation came from AsradeZewude Primary Hospital quality improvement unit as part of maternal service quality improvement.

The quality improvement unit had no involvement in the design, data collection and analysis, write-up, and decision for the results to be published, but it needed only the report or result to design delivery service quality improvement plan accordingly.

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Contributors: GDA generates the idea of the study, design the study, wrote the proposal, collected the data, organized and analyzed, finally wrote the result of the study.

Competing interests: None declared.

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Data sharing Statement: The data collected for this study can be obtained from the author upon a reasonable request.

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Early View

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Laparoscopic Evaluation of Bilateral Tubal Occlusion for Management of Infertility in Dhaka

By Saika Shaheed & Munima Haque
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Abstract- All patients undergoing diagnostic laparoscopy for primary and secondary infertility due to tubal factor at Dhaka Central International Medical College and Hospital from June 2017 to July 2018 are included. Reasons for tubal factor infertility, rates, and therapeutic procedures are investigated.

Results: Seventeen (35.4%) patients with primary and 29 (60.4%) with secondary infertility undertook diagnostic laparoscopy. Bilateral tubal opening for both left and the right tube is visualized for 26 (76.5%), partially blocked for 6 (17.6%) and blocked/occlusion for 2 (5.9%) cases. Tubal openings are highly statistically significant. Also, age and ovary size, age and ovary appearance, indication and therapeutic procedure, indication and sign of ovulation, Indication and uterus position, Indication and uterus position are also found to be significant. Tubal disease is a common aspect liable for infertility. Diagnostic laparoscopy is a important method for total evaluation of female infertility and making remedy choices according to the cause.

Keywords: laparoscopy, tubal occlusion, infertility, therapeutic procedure, management.

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I. Introduction

Infertility is not being able to attain pregnancy for one year of recurrent, unshielded intercourse [1]. The basic reasons for infertility comprise ovulatory disorders (%), tubal disease (%), uterine or cervical issue and endometriosis and male infertility [1, 2]. Assessment usually starts after 12 months, however, can be initiated earlier if infertility is assumed founded on history or the age of the female spouse is over 35 years [1]. Occurrence of infertility seems to be rising in developed countries for causes dissimilar from those in developing countries. Main bases according to WHO (World Health Organization) on a global basis are pelvic tuberculosis, postabortal and postpartum infections leading to tubal obstruction and undernourishment [3]. A vigilant record and physical inspection can recommend a solo or multiple etiology directing the additional study. Pelvic ultrasonography, hormonal assay, and hysterosalpingography are the initial examinations for the uterine, ovarian and tubal disease. Diagnostic laparoscopy is typically the standard procedure performed as one of the valuable tools in the infertility treatment before progressing to infertility cures [4, 5].

Generally, the occurrence of infertility is predicted to be 10%-15% amongst young couples [6-7]. Ovulatory difficulties are the vital widespread reason for female infertility. In 80% of the cases, infertility usually occurs due to some conditions such as endometriosis or polycystic ovary syndrome (PCOS), while in 20% of the cases the etiology of this condition is unexplained [8]. A report published in 1997 shows that about 3%-7% of all couples have an unresolved problem of infertility. However, experiencing infertility for at least one year is reported in 12-28% of cases [9]. Due to the infertility problems and long duration of response to treatment, its correct diagnosis to provide appropriate treatment strategies is highly crucial. There are multiple techniques for the treatment of female infertility. Furthermore, identifying the etiology of infertility and its subsequent treatment does not always lead to viable pregnancy and live birth [8].

Although around 85% to 90% of healthy young couples conceive by one year of attempting and largely conceive by six months, still 10% to 15% - couples have problems conceiving and suffer infertility or subfertility [10-11]. Reproductive endocrinologist reflect a couple to be infertile when: (a) The couple has not conceived subsequently 12 months of contraceptive free - intercourse (the female is less than 34 years old); (b) The couple has not conceived subsequently 6 months contraceptive free -intercourse (the female is more than 34 years old) [12, 13]. The major causes of infertility include; 1. Male factors (20%-30%), 2. Female factors (40%-55%), 3. Male and female factors together (10%-40%), 4. Unexplained infertility (10%-20%) [14]. Infertility is classified into two types: 1. Primary infertility where no prior pregnancies have occurred. 2. Secondary infertility where a previous pregnancy has occurred (might not need to be a live birth). While generally, infertility rates have stayed steady in the previous 30 years in the USA, generally birth and fertility rates are decreasing owing to several social and cultural drifts: women pursuing higher education and careers, postponing marriage for men and women, delaying childbearing, more frequent divorce, and reliable contraception and family formation.

Amongst infertile couples, male infertility counts for around 35%. The reasons for male infertility evolve

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from four key causes: (1) hypothalamic-pituitary disorders (1%–2%); (2) primary gonadal disorders (30%–40%); (3) disorders of sperm transport (10%–20%); and (4) idiopathic (40%–50%). Mostly male infertility is currently idiopathic giving unclear reasoning of the process that controls testicular and sperm operation. Female infertility symbolizes nearly 65% of the causes for the infertile couple. For female infertility, disruption can happen at any cases to instigate infertility: (1) it is necessary for the ovaries to ovulate a matured oocyte on a regularly (ovarian factor); (2) the cervix has to seize and carry sperm into the uterus and fallopian tubes (cervical factor); (3) the fallopian tubes have to seize the ovulated ova and carry sperm and embryo (tubal factor); and (4) the uterus has to permit the embryo to imbed and assist regular evolution and progress (uterine factor) [15]. Tubal factor infertility owing to occlusion and peritoneal pathology initiating adhesions is the key general reason for female infertility and identified in around 30% to 35% of younger and older infertile women [15]. The most predominant reason for tubal factor infertility is pelvic inflammatory disease and severe salpingitis [16]. The important causes of female infertility are 1. Tubal factors (20%-40%), 2. Ovulatory dysfunction (20%-40%), 3. Miscellaneous causes (10%-15%) [17]. The process accountable for tubal factor infertility consists of anatomic anomalies which prevent the coalition of sperm and ovum. Proximal tubal obstructions prevent sperm from getting into the far fallopian tube where fertilization usually happens. Distal tubal occlusions inhibit ovum seize from the neighboring ovary [18].

For most infertile women with no known risk for tubal or pelvic lesions, assessment of the fallopian tubes will usually start with hysterosalpingography (HSG) followed by a diagnostic laparoscopy after six months or more [19, 20]. In other cases, it allows time for treatment-independent conception or a possible fertility-enhancing effect of HSG [21]. The HSG is a valuable inspecting tool for the significant major obstruction to fertility, bilateral tubal occlusion. It is not suitable concerning adhesions or endometriosis. Laparoscopy confirms the HSG findings in approximately 80 percent of cases concerning the determination of tubal patency, but in only 45 percent of cases concerning the diagnosis of other tubal lesions [22, 23]. Thus, multiple clinical supervisions sidestep HSG and progress straight to laparoscopy for accessing instantaneously the fallopian tubes and the pelvic peritoneal cavity [24]. Hysteroscopy is a technique that permits the physician to view inside the uterus for diagnosing and treating reasons of unusual bleeding.

Furthermore, hysteroscopy is implemented to reveal the basis for unsolved spotting or bleeding in postmenopausal women. It varies if it is diagnostic or operative and if an additional method (e.g., laparoscopy) executes at a similar time. In general, diagnostic hysteroscopy takes a reduced amount of time than operative [25]. The indications for laparoscopic surgery have increased widely over the last couple of years owing to it multiple benefits over laparotomy [26]. Growing numbers of gynecological surgeons have adopted a laparoscopic approach to the treatment of ectopic pregnancies (EPs), adhesions, endometriosis, hydrosalpinges, and ovarian cysts [27, 28]. Laparoscopy may be utilized for Myomectomies [29].

Amongst the United States board-certified reproductive endocrinologists 89% routinely instruct diagnostic laparoscopy for couples presenting with a primary complaint of infertility [30]. In Canada, 63% of infertile couples underwent diagnostic laparoscopy in the year in 1995 [31, 32]. Results from another Canadian study of 794 participating couples from 11 clinics selected from 1 April 1984 to 31 March 1987 showed that laparoscopy functioned more suitable than HSG as a forecaster of future fertility [33]. A Belgian review analyzed the accessible proof with respect to concerning alternative diagnostic methods for detecting tuboperitoneal infertility and about the status of diagnostic laparoscopy in women infertility. In some particular clinical venues, the solid proof was found to endorse the utilization of diagnostic laparoscopy in the existing fertility procedure [34].

A review of 206 infertile women undertaking laparoscopy was conducted in Israel [32]. A study performed on 115 infertile women at Fatemiyeh Teaching Hospital, Hamedan, Iran from March 2011-September 2012 showed that the comparison between HSG and LS techniques provides a significant difference in diagnosis of distal fallopian tube occlusion and unilateral fallopian tube occlusion among infertile women [35]. A study conducted on 208 medical records of infertile women at the Yaoundé General Hospital in Benin, Cameroon during December 2007 to December 2012 showed that HSG is of inadequate diagnostic significance in tubal factor infertility and little diagnostic importance in pelvic adhesions [36]. Another cross-sectional study from Hayatabad Medical Complex, Peshawar, Pakistan from January to December 2005 with 136 (70.46%) patients with primary and 57 (29.54%) with secondary infertility undertaking diagnostic laparoscopy showed that tubal disease is a common factor responsible for infertility, and diagnostic laparoscopy is a valuable technique for complete assessment of female infertility and making treatment decisions [37]. A study on 114 primary and secondary infertility patients from a tertiary health care center at Maharashtra, India showed that HSG and Laparoscopy are not alternative but approving techniques for the investigation of tubal patency in infertility [38].

A cross-sectional study with 190 couples in Bangladesh at selected fertility centers of Dhaka city (from September 2011 to March 2012) showed that

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there are 52% cases of female factors, 13% male factors, unexplained 27% and both male and female factors lie behind 8% of cases. This study concluded that proper evaluation with details personal, medical and gynecological history of both female and male need to evaluate the cause and formulate a management plan to treat the secondary subfertile couple [39]. Another epidemiological study of 61 sub-fertile women suffering from primary and secondary subfertility, who had undergone laparoscopy at Bangladesh Medical College hospital during July 2003 to June 2004 was examined. The number of subfertility visits has increased in the last few years due to awareness for available services and option for resolving subfertility [40]. A prospective study on 100 cases of infertile patients (ages 20 to 40 years) undertaken at BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders) during January 2001 to December 2001 showed that for treating infertility, appropriate importance is needed for laparoscopic valuation of pelvic organs [41]. Another study undertaken at BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders) from January 2001 to December 2001 of 100 cases of infertile patients (ages 20 to 40 years) indicate that laparoscopy examination is an essential technique for assessment of tubal pathology impacting infertility and may perform a vital part in infertility supervision [42]. Results with 900 infertile women aged from 18 to 42 years undergoing infertility evaluation by laparoscopy at a private infertility clinic at Dhaka (from January 2002 and October 2004) show that 607 (67.44%) patients had primary infertility, and 293 (32.56%) had secondary infertility, 610 (67.78%) patients had normal while 390 (31.22%) had abnormalities of uterus. [43]. A study carried out amongst 50 infertile women with both primary and secondary infertility (having menstrual cycles with a duration of 25-45 days) from July 2014 to December 2014 in Shaheed Suhrawardi Medical College Hospital, Dhaka showed that the surgical remedy of minimal or mild endometriosis enhances the natural pregnancy frequency in infertility women [44].

Infertility is a main problem influencing the health of women and life quality directing to social and psychological disruptions as well as causing distress and uncertainty to numerous women. This investigation was implemented to review the various reasons of tubal factor infertility using hysteroscopy followed by diagnostic laparoscopy, and their frequency in patients with primary and secondary infertility.

II. Materials and Methods

In this investigation, the infertility patients suffering from infertility are enrolled and under treatment at the Gynecology and Obstetrics department, Dhaka Central International Medical College and Hospital (DCIMCH), Dhaka from June 2017 to July 2018. Patients affected by primary and secondary tubal factor infertility are incorporated into this investigation. The participating patients' ages spanned from 20 to 40 years. Detailed medical history is documented, and clinical examination is done before admission. Fundamental examinations are performed for fitness of anesthesia before laparoscopy.

The hysteroscopy scheduling was done with the additional procedure of Laparoscopy. These combined procedures were performed under general anesthesia by an infertility specialist surgeon (the first researcher). Patients chosen for laparoscopy were entered into the program on 18 to 21 days of their menstrual cycle. The hysteroscopy procedure takes place in the following order: The doctor dilates the cervix to allow the hysteroscope to be inserted; The hysteroscope is then inserted through the vagina and cervix to the uterus; Normal saline is injected into the uterus via the hysteroscope, to enlarge it and to clean up any blood or mucus; Afterward, a light glowed via the hysteroscope provides the doctor to see the uterus and the openings of the fallopian tubes through the uterine cavity; At the end if surgery has to be implemented, then miniature equipments are passed in the uterus through the hysteroscope. Hysteroscopy procedure can take time ranging from $<$ 5 minutes to $>$ hour. For laparoscopy, a 10 mm incision was made inside or just underneath the lower edge of the umbilicus. By this incision, the abdominal cavity is expanded with CO_2 gas, and which creates pneumoperitoneum. A trocar was placed in the same area. The cannula of the trocar was kept there while the trocar was taken out. Afterward, a laparoscope was inserted via the cannula. The abdominal cavity and pelvic were assessed in the Trendelenburg posture. A traumatic grasper forceps were utilized with the help of another trocar for superior viewing. If needed, an additional trocar was introduced.

To evaluate tubal patency, methylene blue was injected through another uterine exploiter and outcome of laparoscopy were documented by the infertility expert. For the patients, the diagnostic procedure was followed by therapeutic procedures. After diagnostic procedures Hysteroscopy, laparoscopy, and dye test the following therapeutics were implemented conferring to the patients' situation: (a) patients having PCOS went through Bilateral ovarian drilling, (b) Patients having adhesion had Adhesiolysis, and (c) those who had cysts, went through Cystectomy.

Diagnostic laparoscopy is usually a well-known method to uncover pelvic organ pathologies influencing fertility. The current research was commenced to explore the tubal pathology causing primary and secondary infertility by the laparoscopic test. This research was performed at the Gynecology and Obstetrics department, DCIMCH through June 2017 to July 2018. The information collected from the patients and the findings of laparoscopy were put together in the data sheet which was analyzed using SPSS (version

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17.0). The local research Ethical Committee of DCIMCH approved the study protocol. The participants gave their consent before enrollment. Guarantee was given to the participants that their data material would be retained privately.

Demographic features were gathered from the interview utilizing a systematized questionnaire form. Results of hysteroscopy and laparoscopy were documented. The characteristics taken for the demographics are age (20-24, 25-29, 30-34, and 35-39) years. For general examination are the indication (primary, secondary infertility, others), anesthesia (G/A or others). For Hysteroscopy findings the characteristics are uterine cavity (well visualized, Septum, Synechia), right tubal opening (visualized, partially blocked, blocked), left tubal opening (visualized, partially blocked, blocked). In laparoscopy findings the characteristics are Uterus size (N/S normal size), bulky, smaller than normal), Uterus position (A/V (anteverted), R/V (retroverted)), Mobility (mobile, restricted), POD (Pouch of Douglas)(free, obliterated), Tubes appearance (apparently healthy, not visualized, others), Dye test (Lt side –ve, Rt side –ve, Lt side –ve, Rt side +ve, Lt side + ve, Rt side +ve, Lt side + ve, Rt side – ve), Ovary appearance (healthy, polycystic/pearly white appearance, Cyst (chocolate/parovarian)). Also Ovary size (normal, enlarged), Sign of ovulation (present, absent), Therapeutic procedure (bilateral ovarian drilling, adhesiolysis, cystectomy).

III. Results

The project consisted of 48 infertile patients aged from 20-40 years. The patient age was highest for 25-29 years total 19 (39.6%). As from the result, 17 (35.4%) patients had primary infertility, and 29 (60.4%) patients had secondary infertility. for only 34 of the patients, uterine cavity can be observed. Amongst them, 30 (88.2%) had well visualized uterine cavity while rest of the patients had septum 2 (5.9%) and Synechia 2 (5.9%). Size of the uterus was normal in 35 (72.9%), bulky in 8 (16.7%) and smaller than normal size found in 5 (10.4%) cases. Uterus position was A/V (anteverted) 43 (89.6%) and R/V (retroverted) for 5 (10.4%) cases. For mobility, it was mobile in 46 (95.8%) and restricted in only 2 (4.2%) cases. POD (Pouch of Douglas) was free for 47 (97.9%) while obliterated for only 1 (2.1%) case. Tubes appearance looked healthy in 37 (77.1%), not visualized in 7 (14.6%) while other types were 4 (8.3%) cases. Dye test gave the highest for Left side positive, Right side positive totaling 22 (45.8%) out of 48 patients. Bilateral tubal opening for both the left and the right tube was visualized for 26 (76.5%), partially blocked for 6 (17.6%) and blocked/occlusion for 2 (5.9%) cases. Ovary appeared healthy for 17 (35.4%), polycystic/pearly white appearance for 18 (37.5%), and cyst (chocolate / parovarian) for 13 (27.1%) of cases. The ovary size was normal for 25 (52.1%), enlarged 21 (43.8%), and smaller than normal for 2 (4.2%) of cases. Sign of ovulation present in 32 (66.7%) and absent in 16 (33.3%) of cases. Therapeutic procedures followed were: Bilateral ovarian drilling 28 (58.3%), Adhesiolysis 11 (22.9%), Cystectomy 5 (10.4%), Drilling and Adhesiolysis combined 2 (4.2%), and Cystectomy and Adhesiolysis combined was performed for 2 (4.2%) cases. General anesthesia was given to all patients.

Table 1: Demographics and General Examination

Characteristic	Category	Frequency (%)
Age (Years)	20-24	13 (27.1%)
	25-29	19 (39.6%)
	30-34	11 (22.9%)
	35-39	5 (10.4%)
Indication	Primary Subfertility	17 (35.4%)
	Secondary Subfertility	29 (60.4%)
	Others	2 (4.2%)

Table 2: Hysteroscopy Findings

Characteristics	Category	Frequency (%)
Uterine Cavity (34)	Well Visualized	30 (88.2%)
	Septum	2 (5.9%)
	Synaechia	2 (5.9%)
Tubal Opening (Right) (34)	Visualized	26 (76.5%)
	Partially Blocked	6 (17.6%)
	Blocked	2 (5.9%)
Tubal Opening (Left) (34)	Visualized	26 (76.5%)
	Partially Blocked	6 (17.6%)
	Blocked	2 (5.9%)

Table 3: Laparoscopy Findings

Characteristic	Category	Frequency (%)
Uterus Size	N/S (Normal Size)	35 (72.9%)
	Bulky	8 (16.7%)
	Smaller than Normal	5 (10.4%)
Uterus Position	A/V (Anteverted)	43 (89.6%)
	R/V Retroverted)	5 (10.4%)
Mobility	Mobile	46 (95.8%)
	Restricted	2 (4.2%)
POD (Pouch of Douglas)	Free	47 (97.9%)
	Obliterated	1 (2.1%)
Tubes Appearance	Apparently Healthy	37 (77.1%)
	Not Visualized	7 (14.6%)
	Others	4 (8.3%)
Dye Test	Lt Side –Ve, Rt Side -Ve	6 (12.5%)
	Lt Side –Ve, Rt Side +Ve	8 (16.7%)
	Lt Side + Ve, Rt Side +Ve	22 (45.8%)
	Lt Side + Ve, Rt Side -Ve	12 (25.0%)
Ovary Appearance	Healthy	17 (35.4%)
	Polycystic / Pearly White Appearance	18 (37.5%)
	Cyst (Chocolate / Parovarian)	13 (27.1%)
Ovary Size	Normal	25 (52.1%)
	Enlarged	21 (43.8%)
	Smaller Than Normal	2 (4.2%)
Sign of Ovulation	Present	32 (66.7%)
	Absent	16 (33.3%)

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Table 4: Therapeutic Procedure

Characteristic	Category	Frequency (%)
Therapeutic Procedure	Bilateral Ovarian Drilling	28 (58.3%)
	Adhesiolysis	11 (22.9%)
	Cystectomy	5 (10.4%)
	Drilling + Adhesiolysis	2 (4.2%)
	Cystectomy + Adhesiolysis	2 (4.2%)

Table 5: Interrelationship among Various Factors

Variables	P-Value
Correlation of Age and Indication (Primary and Secondary Subfertility)	0.193
Tubal Opening Left and Tubal Opening Right	0.000
Age and Uterus Size	0.091
Age and Ovary Size	0.034
Age and Ovary Appearance	0.040
Indication and Therapeutic Procedure	0.009
Age and Sign of Ovulation	0.840
Indication and Sign of Ovulation	0.046
Indication and Tubes Appearance	0.888
Indication and Uterus Position	0.006
Indication and Mobility	0.505
Age and Mobility	0.132
Age and Dye Test	0.950
Indication and Dye Test	0.465
Indication and POD	0.394
Age and POD	0.669
Age and Uterine Cavity	0.281
Indication and Uterine Cavity	0.154
Indication and Uterus Position	0.006

The interrelationship between various variables is given in table 5. The tubal opening left, and tubal opening right are highly statistically significant. Also, age and ovary size, age and ovary appearance, indication and therapeutic procedure, indication and sign of ovulation, Indication and Uterus position, Indication and Uterus position are also found to be significant. On the other hand, no significance was found for indication and mobility, age and mobility, age and dye test, Indication and dye test, indication and POD, age and POD, age and uterine cavity, indication and uterine cavity, indication and tubes appearance, age and sign of ovulation, age and uterus size, correlation of age and indication (primary and secondary subfertility).

IV. Conclusion

Benefits of hysteroscopy and laparoscopy: Hysteroscopy and laparoscopy may have the following advantages in comparison to other methods: briefer hospital stay, shorter recovery time, less pain medication needed after surgery, and possible avoidance of open abdominal surgery. It is a pretty safe procedure. However, similar to any other surgical procedure, complications are possible. With hysteroscopy, complications can happen (< 1% cases): dangers related to anesthesia, infection, heavy bleeding, injury (to the cervix bladder, uterus or bowel), intrauterine scarring, reaction to the substance used to expand the uterus [45-46]. The laparoscopic method gives significant advantages to the patient, e.g., reduced incision size and ordeal with lesser postoperative distress, reduced recovery frequency, and a reduced rate of postoperative wound infections. The laparoscopic method decreases operation of the bowel and peritoneum, causing reduced incidence of postoperative illness. Therefore, intake can be resumed more rapidly than with open surgical techniques, limiting requirements for IV fluid regimes which are associated with tissue edema, modest wound restoration, and lengthier postoperative revival. Secondly, since minor access points are needed for the insertion of laparoscopic trocars, enormous incisions similarly found in open methods are shunned, thus reducing difficulties related to postoperative pain and wound healing. As laparoscopic techniques have evolved, the quantity of port sites needed has been decreased, with single-port surgery currently a feasible possibility. These factors contribute to the lesser occurrence of the wound and systemic infections revealed following laparoscopic surgical procedure. Laparoscopy is beneficial in overweight patients where open methods could be technologically very problematic and for those that are especially invulnerable to wound infections after an operation. Other types of patients to gain assistance from a laparoscopic technique are those having an acute respiratory illness as the postoperative deterioration in respiratory procedure that can happen following large incisions. All these features provided briefer in-patient stay and decreased perioperative illness. Also, many chief procedures that once required prolonged postoperative recovery (e.g., anterior resection of the rectum or radical cystectomy) are currently achieved more by laparoscopic methods to progress patient outcomes. Benefits involve the probability to implement diagnosis and therapy together, and the scope to merge the laparoscopy with the hysteroscopic evaluation of the uterine cavity with an endometrial biopsy, together as a day-care surgical procedure.

Risk factors and disadvantages: Laparoscopic surgery can have hazards related to unique laparoscopic methods or owing to the physiological variations linked to the creation of a pneumoperitoneum. Risk factors include surgery four hour duration, beefy lower limbs, obesity, peripheral vascular disease, hypotension, and steep Trendelenburg positioning [47]. Disadvantages of diagnostic laparoscopy include the need for general

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anesthesia, patient's anxiety, port infection and the possibility of adhesion formation. In a large Finnish follow-up study, the complication rate of diagnostic laparoscopy was 0.6 per 1000 procedures [34].

Laparoscopic surgery involves blowing of gas (mostly CO_2) into the peritoneal cavity producing a pneumoperitoneum, usually at 4-6 liter/min to a pressure of 10-20 mm Hg. This cause an upsurge in intra-abdominal pressure. Carbon dioxide is insufflated into the peritoneal cavity. The pneumoperitoneum is sustained through a continuous gas movement of 200-400 ml/min. The elevated intra-abdominal pressure of the pneumoperitoneum, adjustment to the patients' position and consequences of CO_2 absorption trigger alterations in physiology, especially within the respiratory and cardiovascular structure [48]. General anesthesia with endotracheal intubation and regulated ventilation is believed to be the securest method for laparoscopy as it shields the airway, permit control of PaCO2, and aids surgical exposure; it is highly recommended for lengthy procedures, or patients with a history of gastro-oesophageal reflux [49].

The present study showed that laparoscopy is a helpful method for proper evaluation of pelvic organs. It is a vital technique for diagnosing anatomical, and pathological abnormality of inner genital organs in female patients that produces a major part in infertility supervision. Infertile female patient with assumed pelvic organ abnormality should laparoscopy procedure [42]. At present in Bangladesh, laparoscopy is available in many tertiary care centers, and the amount of expense for performing laparoscopy is comparably cheaper compared to developed countries. Laparoscopy ought to be made accessible and inexpensive at various steps of health care services so that infertile couples can benefit from it. Laparoscopy checkup is a vital means for assessment of tubal pathology providing to infertility and could perform an important function in infertility supervision.

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Conflict of Interest
None.

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FELLOWS

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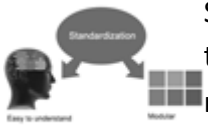


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g) Suitable statistical data should also be given.
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19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



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Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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