



Research Paper

TITLE

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Abstract:

Background:

An ectopic pregnancy, a condition when fetal tissue implants outside of uterus or attaches to an abnormal or scarred portion of the uterus, is associated with high rates of morbidity and mortality if not recognized and treated promptly. Various risk factors such as previous tubal surgery, tubal pathology, in utero diethylstilbestrol exposure, pelvic inflammatory disease, chlamydia, gonorrhea, infertility, intrauterine contraceptive device, endometriosis and taking the progesterone only contraceptive and smoking were associated with the incidence of ectopic pregnancy. The ectopic pregnancy may be managed medically, surgically or expectantly. However the management is tailored to. This study was done to measure the incidence, risk factors and treatment outcome of the ectopic pregnancy at the institutional level in Al Ahsa district of Saudi Arabia.

Materials and Methods:

It was a cross sectional retrospective chart review study in which data were collected from the medical records of the patients attending the MCH, Al Ahsa during the six months of time. The sample size was calculated using a Fisher's formula which contained 182 pregnant women coming for management of pregnancy..random sampling method was used to select the sample. A data collection sheet was prepared based on the similar past studies. The data were entered and analyzed by using the SPSS version 21. Descriptive statistics and analytic statistics using Chi Square tests and logistic regression analysis to test for the association and/or the difference

between two categorical variables were applied. A *p*-value equal to or less than 0.05 was considered statistically significant

Results:

The medical records of 187 pregnant women could be reviewed. The mean age of the subjects was 32.7 years \pm Std. Dev. 6.24 years. The mean BMI of the subjects was 33.45 Kg /M² \pm . The vast majority of the women were obese (87.2%) . The majority of the subjects were non- smoker (89.3) . More than seventeen percent of the subjects were having the history of ectopic pregnancy. Almost twenty two percent of the women (21.9%) were using IUD while 29.4% were having the history of endometriosis. Thirty eight percent of the subjects had the history of tubal surgery. Almost nineteen percent (18.7%) of the subjects had history of sexually transmitted disease. and 15% of the subjects were having history of infertility. Almost 11% were diagnosed as suffering from ectopic pregnancy. Unilateral salpingectomy was done on the majority of the patients (53.85%) suffering from ectopic pregnancy followed by 15.38% who were cured by medical treatment, 15.37% by laparotomy and 7.70% each by salpingoophoretomy and salpingostomy respectively. The women who had history endometriosis found to be 4.60 times likely to get ectopic pregnancy than those without it (95% CI 2.23-9.47). Those women with history of previous ectopic pregnancy was 2 times likelihood of developing ectopic pregnancy (OR;2.03 ,95% CI 1.01-4.05). The women with the history of sexually transmitted disease had 8 times chance of developing ectopic pregnancy (OR 8.86 , 95% CI 3.93-19.99). History of using IUD and infertility was 11 and 3.72 times associated with the development of ectopic pregnancy respectively (OR 11.11; 95% CI 5.0-24.68 and OR 3.72 ; 95% I 1.60-8.65).

Conclusion:

The present study has shown a very high incidence rate of ectopic pregnancy among the pregnant women attending the MCH during the specific period of time which is a matter of concern. However the present study was just chart review study with a small sample. There is a need of conducting a case control study to find out more accurate measurement of risk factors for developing ectopic pregnancy. There is need of formulating a teaching programme directed towards the women especially the pregnant women to control the modifiable risk factors of developing the ectopic pregnancy.

Key words: Ectopic pregnancy, Risk factors, Management

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I. Introduction:

An ectopic pregnancy, a condition when fetal tissue implants outside of uterus or attaches to an abnormal or scarred portion of the uterus , is associated with high rates of morbidity and mortality if not recognized and treated promptly. Most of all ectopic pregnancies i.e. more than 90% occur in a fallopian tube. A worldwide estimated prevalence of ectopic pregnancy has been documented to be 1-2%. In the United States, 1% to 3% of all pregnancies are ectopic.^[1] NHS of UK reports that 1 in every 90 pregnancies is ectopic,^[2] An increasing trend of ectopic pregnancies have been reported from various studies. An American study has shown that rates per 1000 pregnancies increased over 15- year period from 19.2 to 26.2% in 2005-2007.^[3] An Iranian study has also shown an increase trend of ectopic pregnancy in the recent years. According to one study the incidence increased from 1.5 per 1000 pregnancy in 2000 to 4.8 per 1000 pregnancies in 2010.^[4] Various risk factors have been associated with the ectopic pregnancy. According to one meta-analysis previous ectopic pregnancy; previous tubal surgery, tubal pathology and in utero diethylstilbestrol exposure were strongly associated with the occurrence of ectopic pregnancy. However pelvic inflammatory disease, chlamydia, gonorrhoea, infertility were also mildly associated with the incidence of ectopic pregnancy. ^[5] However ACOS has reported that one half of all women who had ectopic pregnancy did not have known risk factors.^[6] Ectopic pregnancy foundation has found female aged between 25 and 34 years old, intrauterine contraceptive device, endometriosis and taking the progesterone only contraceptive and smoking were also associated with ectopic pregnancy.^[7] The symptoms of ectopic pregnancy develop between the 4th and 12th week of pregnancy. The main symptoms consist of unusual vaginal bleeding, low back pain and mild pain in the abdomen or pelvis in the initial stage but as ectopic pregnancy grows, it can cause serious symptoms especially if a fallopian tube ruptures which can lead to sudden, severe pain in the abdomen, or pelvis, shoulder pain, weakness, dizziness or fainting .A ruptured fallopian tube can cause life threatening internal.^[8] The ectopic pregnancy may be managed medically, surgically or expectantly. However the management is tailored to individual patients, based on their presentation and on the severity of their condition. Medical treatment is applied on patients who are haemodynamically stable and have minimal symptoms and who have low volume of intraperitoneal fluid on ultrasound .Methotrexate as intramuscular injection is widely used and successful medical therapy and is generally administered in a single dose protocol. Surgical management is required in the clinical scenario of a ruptured ectopic pregnancy when laparoscopic approach is preferred to do the salpingectomy of the diseased

side. A salpingectomy is the surgical removal of fallopian tube. the Expectant management is a conservative management which consists of observation and assessment of whether the ectopic pregnancy is continuing to resolve spontaneously and successfully without any intervention. The predictor for spontaneous resolution of ectopic pregnancy is declining quantitative beta-hCG levels. There has been increased interest in the recent years towards expectant treatment of ectopic pregnancy .This is due to increased detection of ectopic pregnancy and a trend towards a more conservative non-surgical treatment of ectopic pregnancy.^[9] Study shows that non-surgical treatment was more common in the management of ectopic pregnancy. Urooj Mahboob et al in their study have reported 80% of their patients with ectopic pregnancy were successfully treated with methotrexate injection while 6.7% each went for emergency laparotomy and operative laparoscopy respectively. ^[10] In other study the researchers have reported that 5.77% of the patients with ectopic pregnancy were successfully treated by methotrexate injection while 62.90% of the patients were treated by emergency laparotomy and the rest 29.0% were managed by operative laparoscopy.^[11] Determining the incidence, the risk factors and management of ectopic pregnancy is important to know the magnitude of this condition and to formulate an action plan to reduce the complication and prompt intervention. Very few studies have been conducted in Saudi Arabia on the incidence, risk factors and treatment outcome at the institutional level. To the best of our knowledge this study will be first of its kind in the Al Ahsa district of Saudi Arabia.

II. Materials and Methods:

The present study was a cross sectional retrospective chart review study in which data were collected from the medical records of the patients attending the Maternity and Child hospital , Al Ahsa during the last six months of time. The total number of pregnant women attending the gynecology clinics of Maternity and Child hospital Al Ahsa, Saudi Arabia for management during the last year was the study population. The sample size was calculated using a Fisher's formula by cited by Mugenda & Mugenda (1999); where $n = Z^2pq / e^2$ Where n = the desired sample size, Z = the standard normal deviate at 95% confidence level (1.96). P = the estimated incidence of ectopic pregnancy documented in a similar study in Saudi Arabia was 1.19%.^[12] and q= 1-p.The calculated sample size was 192 pregnant women coming for management of pregnancy. The sampling was done by selecting every second pregnant women from the OPD files. We selected the suitable cases who attended the hospital over a time period June 2022 till November 2022.The sampling participant were added till the sample size was achieved. A data collection sheet was prepared based on the similar past studies. The data sheet included two sections. The first section was concerned with the sociodemographic variables (Such as age, BMI, gravida, parity, smoking status), past history of ectopic pregnancy, history of IUD use , History of STD, History of tubal surgery, endometriosis and infertility , any chronic disease, BMI , Diet habit while the second part consisted of pregnancy status, site of ectopic pregnancy and management of etopic pregnancy. Previously validated questionnaires in one study were modified accordingly and used in this study. The data were entered and analyzed by using the statistical package for social sciences, version 21 (SPSS, Chicago, IL, USA).Descriptive statistics was presented using counts, proportions (%), mean \pm standard deviation whenever appropriate. Analytic statistics using Chi Square tests (χ^2) and regression analysis to test for the association and/or the difference between two categorical variables were applied. A p-value equal to or less than 0.05 was considered statistically significant. An approval letter from the research committee of the MCH hospital was taken before starting the research. Consent was also taken from each participant of the study.

III. Results:

The medical records of 187 pregnant women who visited the hospital during the specified period of time could be reviewed for the study making a response rate of 97%. The mean age of the subjects was 32.7 years \pm Std. Dev. 6.24 years (Range 20 years -47 years).The mean gravida of the subjects was 3.45 \pm Std. Dev. 2.30 (range 0-11).The mean parity of the subjects was 1.46 \pm \pm Std. Dev. 1.60 (Range 0- 6).The mean BMI of the subjects was 33.45 Kg /M² \pm Std. Dev. 3.16 Kg /M² (range 21.70-41.50). The vast majority of the women were obese (87.2%) while 10.7% were overweight and only 2.1% were of normal weight. The majority of the subjects were non-smoker(89.3) while 10.7 were past smoker . More than seventeen percent of the subjects were having the history of ectopic pregnancy. Almost twenty two percent of the women (21.9%) were using IUD while 29.4% were having the history of endometriosis. Thirty eight percent of the subjects had the history of tubal surgery. Almost nineteen percent (18.7%) of the subjects had history of sexually transmitted disease. and 15% of the subjects were having history of infertility. The details of the demographic characteristics are shown in table 1

Table1: Showing the details of the demographic characteristics of the participants

Variables	No.	Percentage
Age: Mean age 32.7 years \pm Std. Dev. 6.24 years (Range 20 years -47 years)		
Variables	No.	Percentage
Age: Mean age 32.7 years \pm Std. Dev. 6.24 years (Range 20 years -47 years)		
Age group 20-24 years		
25-30 years	23	12.3
31-34 years	32	17.1
35-40 years	65	34.8
>40 years	33	17.6
	34	18.2
Gravida: Mean 3.45 \pm Std. Dev. 2.30 (range 0-11).		
Parity: Mean: 1.46 \pm \pm std. Dev. 1.60 (Range 0-6).		
BMI: Mean 33.45 Kg /M ² \pm Std. Dev. 3.16 Kg /M ² (range 21.70-41.50). Normal weight Overweight Obese		
	4	2.1
	20	10.7
	163	87.2
Smoking status Non smoker Past smoker		
	167	89.3
	20	10.7
History of ectopic pregnancy Yes No.		
	32	17.1
	155	82.9
History of using IUD Yes No		
	35	18.7
	152	81.3
History of tubal surgery Yes No		
	71	38.0
	116	62.0
History of STD Yes No		
	35	18.7
	152	81.3
History of infertility Yes No		
	28	15.0
	159	85.0
History of endometriosis Yes		

No	55	29.4
	132	70.6

Prevalence, clinical characteristic, management and outcome of the management of the ectopic pregnancy

The vast majority (93.05) of the women had normal pregnancy and the rest 6.95% were diagnosed as suffering from ectopic pregnancy. The majority of the subjects with ectopic pregnancy (53.85%) had implanted ovum at the site of ampulla of the fallopian tube while 15.38% had implantation site at the cornu, 7.69 % on the isthmus and 23.08 % on the fimbria of the ovary. As far as the management of ectopic pregnancy is concerned unilateral salpingectomy was done on the majority of the patients (53.85%) suffering from ectopic pregnancy followed by 15.38 % who were cured by medical treatment, 15.37% by laparotomy and 7.70% each by salpingo-oophorectomy and salpingostomy respectively . The details of the clinical characteristic and management of the ectopic pregnancy is shown in table 2.

Table 2: Showing the details of the clinical characteristic and management of the ectopic pregnancy

Variables	No.	Percentage
Pregnancy status		
Normal pregnancy		
Ectopic pregnancy	174	93.05
	13	6.95
Site of ectopic pregnancy (N=13)		
Ampulla of fallopian tube	7	53.85
Corneal portion of the fallopian tube (inside uterus)	2	15.38
isthmus portion of the fallopian tube	1	7.69
Fimbria of the fallopian tube	3	23.08
Management: (N=13)		
Unilateral salpingostomy	7	53.85
Laparotomy	2	15.37
Salpingo-oophorectomy	1	7.70
Salpingostomy	1	7.70
Medical management	2	15.38

Risk factors and its association with the demographic characteristic:

The ectopic pregnancy was more prevalent among the obese women as compared to those who were normal pregnant (84.61% vs.81.03%, $P= 0.043$). Ectopic pregnancy incidence was also highly associated with the history of tubal surgery (51.16% vs.45.40%, $P=0.033$). The ectopic pregnancy was also significantly more prevalent among the women with history of Sexually transmitted disease (48.83% vs.14.41. %, $P=0.000$) and among the women who had the history of endometriosis than those without it (55.81 vs.44.19%, $P=0.000$). Similarly the ectopic pregnancy was also significantly more prevalent among the women with infertility (56.67% vs. 18.29%. $P=0.000$). The details of the associated risk factors with the ectopic pregnancy are shown in table 3;

Table3: Showing the details of the associated risk factors with the ectopic pregnancy

Variables	Ectopic pregnancy	Normal pregnancy	P value
BMI			0.043
Normal weight	0(0.0)	18 (10.34)	
Overweight	2(15.38)	18(10.34)	
Obsess	11 (84.61)	141(81.03)	
History of ectopic pregnancy			0.011
Yes	7(53.84)	40(22.98)	
No	6(46.16)	134(77.01)	
History of using IUD			0.000

Yes	8(65.22.)	79(45.40)	
No	5 (34.78.)	95(54.59)	
History of tubal surgery			0.033
Yes	7(51.16)	80(45.98)	
No	6 (48.14)	94(54.02)	
History of STD			0.000
Yes	6(46.15)	22(13.41)	
No	7(53.85.)	152(86.59)	
History of endometriosis			0.000
Yes	7(53.85.)	72(41.37)	
No	6 (46.15)	102(55.81)	
History of infertility			0.003
Yes	8(61.53)	30(17.24)	
No	9(38.47)	144(82.76)	

Logistic regression analysis:

The women who had history endometriosis found to be 4.60 times likely to get ectopic pregnancy than those without it (95% CI 2.23-9.47). Those women with history of previous ectopic pregnancy was 2 times likelihood of developing ectopic pregnancy (OR;2.03 ,95% CI 1.01-4.05). The women with the history of sexually transmitted disease had 8 times chance of developing ectopic pregnancy (OR 8.86 , 95% CI 3.93-19.99). History of using IUD and infertility was 11 and 3.72 times associated with the development of ectopic pregnancy respectively (OR 11.11; 95% CI 5.0-24.68 and OR 3.72 ; 95% I 1.60-8.65).

IV. Discussion:

The present study was a hart review study which was an attempt to find out the incidence of ectopic among the pregnant women attending the MCH, Al Ahsa during a specific period of time. The study has found a high incidence of ectopic pregnancy (6.95%) among the pregnant women in the local population. In a similar study conducted in Saudi Arabia, Al-Turki HA has found a prevalence of ectopic pregnancy in the general population to be 1.13%.^[12] In a French study the researchers have found the rate of ectopic pregnancy to be 20.2 per 1000 live births and 15.98 per 1000 reported pregnancies.^[13] The German cohort study on 30,247 pregnancies over 10 years of time has shown an incidence of 1.05% of ectopic pregnancy.^[14] In Chinese study has shown that women with newly diagnosed ectopic pregnancy significantly increased annually, from 698 cases in 2003 to 1860 cases in 2013 ($p \leq 0.0001$) showing an increasing trend.^[15] An Indian study has reported an Incidence of 5.29 ectopic pregnancy per 1000 births.^[16] In an Ethiopian study the researchers have reported a prevalence of ectopic pregnancy to be 3.61%.^[17] Ampulla of the fallopian tube followed by fimbria of ovary was the most common sites of ectopic pregnancy in the present. Studier Darter in her article has also reported the mid ampullary portion of the fallopian tube as the most common site of ectopic pregnancy followed by the isthmic portion of the fallopian tube and the fimbria portion of the fallopian tube.. A 10 year population-based French study has also reported ampulla of the fallopian tube (70% most common site of ectopic pregnancy followed by isthmus (12%) and fimbria (11.1%).^[18]

Like the present study one Ethiopian study has also reported that Fallopian tube was the commonest site of ectopic gestation (63.77%) followed by ampullary (20.29%), isthmic (5.80%) and fimbrial (1.45%).^[17] As far as the risk factors of ectopic pregnancy is concerned. History of using IUD was the most important risk factor in the present study followed by history of STD, History of endometriosis and history of infertility and history of previous ectopic pregnancy. The Ethiopian study has also reported history of STD (AOR=4.68, 95%CI: 3.04–7.19), history of ectopic pregnancy (AOR=5.74, 95%CI: 3.81–8.65), and emergency contraceptive use (AOR=8.72, 95%CI: 2.90–26.20) as the determinant factors for the occurrence of ectopic pregnancy.^[17] Unlike our study Ally Saetta, et al in their 10-year retrospective cohort study did not find significant association between endometriosis and the ectopic pregnancy.^[19] A Pakistani review study has also noted infertility, history of ectopic pregnancy and use of IUD as the risk factors for developing ectopic pregnancy .However in this study pelvic inflammatory disease and past history of abortion were also the important determinants of ectopic pregnancy.^[20] History of pelvic adhesions showed the greatest impact on the incidence of ectopic pregnancy (AOR 2.49 95% CI 1.53–4.07 $p < 0.001$) in one Italian study.^[21] A meta-analysis of published literature has documented the odds ratio (ORs) of ectopic pregnancy with current IUD

use has shown an increased risk of ectopic pregnancy (pooled OR: 10.63, 95% confidence interval (CI): 7.66-14.74 while Past IUD use could mildly increase the risk of ectopic pregnancy (pooled OR: 1.40, 95% CI: 1.23-1.59).^[22]

Majority of the patients with ectopic pregnancy in the present study were completely treated by unilateral salpingectomy followed by medical treatment. In the Ethiopian study also unilateral salpingectomy was performed in 79.71% of cases.^[17] Almost 5% each of the ectopic pregnancy in the present study were treated by salpingo-oophorectomy as compared to 11.59% in the Ethiopian study.^[17] However one fourth of the patients were treated by medical management in the present study.

V. Conclusion:

The present study has shown a very high incidence rate of ectopic pregnancy among the pregnant women attending the MCH during the specific period of time which is a matter of concern. However the present study was just chart review study with a small sample. There is a need of conducting a case control study to find out more accurate measurement of risk factors for developing ectopic pregnancy. There is need of formulating a teaching programme directed towards the women especially the pregnant women to control the modifiable risk factors of developing the ectopic pregnancy.

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