

Correlation between Ectopic Pregnancy and Previous Tubal Ligation in Rural Medical College

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Abstract: Risk factors for ectopic pregnancy include: pelvic inflammatory disease, often due to chlamydia infection, tobacco smoking, prior tubal surgery, a history of infertility, and the use of assisted reproductive technology.

We have to find out whether there is association of ectopic pregnancy with other etiological factors and risk factors in a peripheral medical college of West Bengal.

100 women admitted with ectopic pregnancy in the Department of Obstetrics And Gynaecology within the study period between April 2016-November 2018 at Midnapore Medical College and Hospital, Paschim Midnapore, West Bengal.

We found that the mean of age (mean \pm s.d.) of patients was 25.4000 ± 3.5777 years. The mean of gestation age (mean \pm s.d.) of patients was 41.9308 ± 5.9222 days. The proportion of no history of infertility was significantly higher than history of infertility ($p < 0.0001$) and the proportion of no history of IUD was significantly higher than no history of IUD ($p < 0.0001$). 23 (17.7%) patients had history of PID, 55 (42.3%) patients had Pre CS and 28 (21.5%) patients had Previous BTL.

PID is the identifiable risk factor leading to ectopic pregnancy. In addition, those who provide care to women of childbearing age should not assume that a history of tubal sterilization rules out the possibility of an ectopic pregnancy in a woman who has symptoms or signs of pregnancy, especially of ectopic pregnancy.

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I. Introduction

The rate of ectopic pregnancy is about 1 and 2% of that of live births in developed countries, though it is as high as 4% in pregnancies involving assisted reproductive technology. Between 93 and 97% of ectopic pregnancies are located in a Fallopian tube. Ectopic pregnancy is a complication of pregnancy in which the embryo attaches outside the uterus. Signs and symptoms classically include abdominal pain and vaginal bleeding. Risk factors for ectopic pregnancy include: pelvic inflammatory disease, often due to chlamydia infection, tobacco smoking, prior tubal surgery, a history of infertility, and the use of assisted reproductive technology. Those who have previously had an ectopic pregnancy are at much higher risk of having another one. Most ectopic pregnancies (90%) occur in the Fallopian tubes which are known as tubal pregnancies. Implantation can also occur on the cervix, ovaries, or within the abdomen. Detection of ectopic pregnancy is typically by blood tests for human chorionic gonadotropin (hCG) and ultrasound. Prevention is by decreasing risk factors such as chlamydia infections through screening and treatment. The rate of ectopic pregnancy is about 1 and 2% that of live births in developed countries, though it may be as high as 4% among those using assisted reproductive technology. It is the most common cause of death among women during the first trimester at approximately 10% of the total. In the developed world outcomes have improved while in the developing world they often remain poor. The risk of death among those in the developed world is between 0.1 and 0.3 percent while in the developing world it is between one and three percent.

Rupture of an ectopic pregnancy can lead to symptoms such as abdominal distension, tenderness, peritonism and hypovolemic shock. A woman with ectopic pregnancy may be excessively mobile with upright posturing, in order to decrease intrapelvic blood flow, which can lead to swelling of the abdominal cavity and cause additional pain. The most common complication is rupture with internal bleeding which may lead to

hypovolemic shock. Death from rupture is still the leading cause of death in the first trimester of the pregnancy.⁹

Hair-like cilia located on the internal surface of the Fallopian tubes carry the fertilized egg to the uterus. Fallopian cilia are sometimes seen in reduced numbers subsequent to an ectopic pregnancy, leading to a hypothesis that cilia damage in the Fallopian tubes is likely to lead to an ectopic pregnancy.¹⁴ Women who smoke have a higher chance of an ectopic pregnancy in the fallopian tubes. Smoking leads to risk factors of damaging and/or killing cilia. As cilia degenerate, the amount of time it takes for the fertilized egg to reach the uterus will increase. The fertilized egg, if it doesn't reach the uterus in time, will hatch from the non-adhesive zonapellucida and implant itself inside the fallopian tube, thus causing the pregnancy.¹⁴

Women with pelvic inflammatory disease (PID) have a high occurrence of ectopic pregnancy. This results from the build-up of scar tissue in the Fallopian tubes, causing damage to cilia. If however both tubes were completely blocked, so that sperm and egg were physically unable to meet, then fertilization of the egg would naturally be impossible, and neither normal pregnancy nor ectopic pregnancy could occur. Intrauterine adhesions (IUA) present in Asherman's syndrome can cause ectopic cervical pregnancy or, if adhesions partially block access to the tubes via the ostia, ectopic tubal pregnancy. Asherman's syndrome usually occurs from intrauterine surgery, most commonly after D&C.¹⁵ Endometrial/pelvic/genital tuberculosis, another cause of Asherman's syndrome, can also lead to ectopic pregnancy as infection may lead to tubal adhesions in addition to intrauterine adhesions.¹⁶

Tubal ligation can predispose to ectopic pregnancy. Reversal of tubal sterilization (Tubal reversal) carries a risk for ectopic pregnancy. This is higher if more destructive methods of tubal ligation (tubal cautery, partial removal of the tubes) have been used than less destructive methods (tubal clipping). A history of a tubal pregnancy increases the risk of future occurrences to about 10%. This risk is not reduced by removing the affected tube, even if the other tube appears normal. The best method for diagnosing this is to do an early ultrasound. We have to find out whether there is association of ectopic pregnancy with other etiological factors and risk factors in a peripheral medical college of West Bengal.

II. Materials And Method

STUDY POPULATION

100 women admitted with ectopic pregnancy in the Department of Obstetrics and Gynaecology within the study period between April 2016-November 2018 at Midnapore Medical College and Hospital, Paschim Midnapore, West Bengal. This was prospective, observational and descriptive study

INCLUSION CRITERIA:

- 1) All case of ectopic pregnancy admitted in this Department.
- 2) Diagnosis may be before or after admission.

EXCLUSION CRITERIA:

- 1) Women not willing to participate in this study.
- 2) Women with unilateral ligation due to any cause (eg. difficult operation postponed the ligation of second tube specially in camp-ligation)

III. Study Technique

This prospective study was done in the Dept. of Obst. & Gynaecology, Medinipur Medical College & Hospital, Medinipur over a period of one year, where the medical records of patients with the diagnosis of ectopic pregnancy was reviewed. Written consent was taken from patient or patient parties. This study was done after getting approval from ethical committee and it was performed in the Dept. of Obs. And Gynaecology, MMC&H. Data was collected on initial presentation, chief medical complaints, sociodemographic characteristics, past obstetrics and gynaecological history, history of previous surgeries (tubal, ovarian and/or uterine), history of infertility and use of ovulation induction and history of contraception was obtained. Besides radiological and histopathological investigations report was included.

IV. Data Collection Forms

After approval from Institutional Ethics Committee, informed and written consent was taken from eligible women or party who are willing to participate in this study. Women fulfilling selection criteria will be included and relevant history will be taken, examination and investigation was done and result will be analysed. A well designed proforma containing various parameters under study were used for data collection. The data will be maintained computer.

V. Statistical Analysis

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. and GraphPad Prism version 5. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Z-test (Standard Normal Deviate) was used to test the significant difference of proportions. P-value ≤ 0.05 was considered for statistically significant.

VI. Result And Analysis

10(7.7%) patients had ≤ 20 years of age, 59(45.4%) patients had 21-25 years of age, 49(37.7%) patients had 26-30 years of age and 12(9.2%) patients had 31-35 years of age. This proportion was not statistically significant ($p=0.20766$). 109(83.8%) patients had rural and 21(16.2%) patients had urban. The rural proportion was significantly higher than urban ($p<0.0001$). 10(7.7%) patients had upper middle socio economic status, 19(14.6%) patients had lower middle socio economic status, 44(33.8%) patients had upper lower socio economic status and 57(43.8%) patients had lower socio economic status. This proportion was not statistically significant ($p=0.09894$). 72(55.4%) patients had 0 abortions, 50(38.5%) patients had 1 abortion and 8(6.2%) patients had 2 abortions. The proportion of two abortion was significantly higher than others ($p=0.00634$). 21(16.2%) patients had 0 parity, 4(3.1%) patients had 1 parity, 69(53.1%) patients had 2 parity, 31(23.8%) patients had 3 parity, 4(3.1%) patients had 4 parity and 1(0.8%) patient had 5 parity. The proportion of two parity was significantly higher than others ($p<0.0001$). 7(5.4%) patients had 25-30 days of gestational age, 15(11.5%) patients had 31-35 days of gestational age, 20(15.4%) patients had 36-40 days of gestational age, 56(43.1%) patients had 41-45 days of gestational age, 27(20.8%) patients had 46-50 days of gestational age and 5(3.8%) patients had 51-55 days of gestational age. The proportion of 41-45 days of gestational age was significantly higher than others ($p=0.00012$). The mean of age (mean \pm s.d.) of patients was 25.4000 ± 3.5777 years. The mean of gestation age (mean \pm s.d.) of patients was 41.9308 ± 5.9222 days.

115(88.5%) patients had no history of infertility and 15(11.5%) patients had history of infertility. The proportion of no history of infertility was significantly higher than history of infertility ($p<0.0001$). 108(83.1%) patients had no history of IUD and 22(16.9%) patients had history of IUD. The proportion of no history of IUD was significantly higher than no history of IUD ($p<0.0001$). 107(82.3%) patients had no history of PID and 23(17.7%) patients had history of PID. The proportion of no history of PID was significantly higher than history of PID ($p<0.0001$). 75(57.7%) patients had no pre CS and 55(42.3%) patients had Pre CS. The proportion of no Pre CS was significantly higher than Pre CS ($p=0.01314$). 102(78.5%) patients had no previous BTL and 28(21.5%) patients had Previous BTL. The proportion of no Previous BTL was significantly higher than Previous BTL ($p<0.0001$). 98(75.4%) patients had ruptured and 32(24.6%) patients had unruptured. The proportion of ruptured was significantly higher than unruptured ($p<0.0001$). 72(55.4%) patients had in left side and 58(44.6%) patients had in right side. This proportion was not statistically significant ($p=0.08186$). 112(86.2%) patients had no endometriosis and 18(13.8%) patients had endometriosis. The proportion of no endometriosis was significantly higher than endometriosis ($p<0.0001$). 107(82.3%) patients had no pelvic inflammatory disease and 23(17.7%) patients had pelvic inflammatory disease. The proportion of no pelvic inflammatory disease was significantly higher than pelvic inflammatory disease ($p<0.0001$).

VII. Discussion

Present study was conducted in the department of obstetrics and gynaecology in Midnapore Medical College, Midnapore, and West Bengal. 130 patients with ectopic pregnancy were selected in this study. All the patients were admitted and they were undergoing clinical examinations and detailed history taking. Routine baseline investigations were performed. Written informed consent was obtained from each woman prior to inclusion into the study.

Sefogah¹⁷ et al found that a patient presented with ectopic pregnancy at the age of 35 years old. Shah JP et al¹⁸ showed that the mean age of ectopic pregnancy patients were 25.84 years. HERBERT B. P ETERSON et al¹⁹ found that the median age of the women at the time of sterilization was 30 years (range, 18 to 44; mean [SD], 31 ± 6). We found that the proportion of age was not statistically significant. The mean of age (mean \pm s.d.) of patients was 25.4000 ± 3.5777 years.

Shah JP et al¹⁸ found that 4 patients had parity 2, 7 patients had parity 3 and 2 patients had parity 4. We found that 21(16.2%) patients had 0 parity, 4(3.1%) patients had 1 parity, 69(53.1%) patients had 2 parity, 31(23.8%) patients had 3 parity, 4(3.1%) patients had 4 parity and 1(0.8%) patient had 5 parity.

We found that the mean of gestation age (mean \pm s.d.) of patients was 41.9308 ± 5.9222 days.

There are a number of risk factors for ectopic pregnancies, even though in up to 50% of cases, there have been no risk factors identified. Known risk factors include previous pelvic inflammatory disease (PID), assisted reproductive technology (ART), use of intrauterine contraceptive device (IUD), previous ectopic, tubal surgery, intrauterine surgery and smoking²⁰.

The failure rate is higher in the patients undergoing tubal ligation at the time of Caesarean section²¹. If it occurs, this pregnancy is usually extra uterine or ectopic in location, with most common site being the interrupted fallopian tubes. It has also been reported in ovaries or intra-abdominal locations²². The patient with ectopic pregnancy after BTL can have serious and fatal consequences in untreated cases or where the treatment is delayed. Because the sterilization confers a good sense of security, the patient typically does not suspect pregnancy and so may overlook the signs and symptoms, thus reporting late.²¹

HERBERT B. P ETERSON et al¹⁹ found that out of 143 pregnancies, 47 (32.9 percent) were ectopic; all but 8 of these (an ovarian pregnancy after bipolar coagulation) were tubal pregnancies. Classification of 76.6 percent of the ectopic pregnancies was based on a review of medical records. Chi et al²³ found that of the 194 confirmed pregnancies conceived after sterilisation procedures, 15 were ectopic. Uncorrected incidence rates of 0.64 per 10,000 sterilisation procedures and 7.7 per 100 pregnancies conceived after tubal sterilisation were derived.

We found that the proportion of no history of infertility was significantly higher than history of infertility ($p < 0.0001$) and the proportion of no history of IUD was significantly higher than no history of IUD ($p < 0.0001$). The proportion of no history of PID was significantly higher than history of PID ($p < 0.0001$) and the proportion of no Pre CS was significantly higher than Pre CS ($p = 0.01314$). 102(78.5%) patients had no previous BTL and 28(21.5%) patients had Previous BTL. The proportion of no Previous BTL was significantly higher than Previous BTL ($p < 0.0001$).

Shah JP et al¹⁸ reported that six of the thirteen patients came with ruptured ectopic pregnancy; five came with un-ruptured ectopic pregnancy and two with a chronic ectopic gestation. We showed that 98(75.4%) patients had ruptured and 32(24.6%) patients had unruptured. The proportion of ruptured was significantly higher than unruptured ($p < 0.0001$).

VIII. Conclusion

This study has demonstrated that even though ectopic pregnancy after bilateral tubal ligation is not common, sterilization does not confer permanent infertility in all cases. These women should be adequately counselled on the rare possibility of failure. The most of the cases had undergone tubectomy in campus and hence the only possible explanation could be improper aseptic measures leading to scarring of the tubes as a result of post tubectomy infection or inflammation. PID is the identifiable risk factor leading to ectopic pregnancy. In addition, those who provide care to women of childbearing age should not assume that a history of tubal sterilization rules out the possibility of an ectopic pregnancy in a woman who has symptoms or signs of pregnancy, especially of ectopic pregnancy. Although ectopic pregnancy can never be completely prevented, but its incidence can be reduced along with reduction of maternal morbidity and mortality by efficacious diagnostic and interventional strategies aimed at all the women at high risk for ectopic pregnancy.

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Table: Distribution of age, Residential Status, SES, Abortion, Parity and Gestation age

		Frequency	Percentage	Z-Score	p-value
Age (Years)	≤20	10	7.7%	1.2585	0.20766
	21-25	59	45.4%		
	26-30	49	37.7%		
	31-35	12	9.2%		
Residential Status	Rural	109	83.8%	10.9151	<0.0001
	Urban	21	16.2%		
SES	Upper middle	10	7.7%	1.6541	0.09894
	Lower middle	19	14.6%		
	Upper lower	44	33.8%		
	Lower	57	43.8%		
Abortion	0	72	55.4%	2.7339	0.00634
	1	50	38.5%		
	2	8	6.2%		
Parity	0	21	16.2%	4.8441	<0.0001
	1	4	3.1%		
	2	69	53.1%		
	3	31	23.8%		
	4	4	3.1%		
	5	1	0.8%		
Gestation age (Days)	25-30	7	5.4%	3.858	0.00012
	31-35	15	11.5%		
	36-40	20	15.4%		
	41-45	56	43.1%		
	46-50	27	20.8%		
	51-55	5	3.8%		
	Mean	SD	Minimum	Maximum	Median
Age (Years)	25.4000	3.5777	19.0000	34.0000	25.0000
Gestation age (Days)	41.9308	5.9222	25.0000	55.0000	43.0000

Table: Distribution of Parameters

		Frequency	Percentage	Z-Score	p-value
H/O infertility	No	115	88.5%	12.4035	<0.0001
	Yes	15	11.5%		
H/O IUD	No	108	83.1%	10.667	<0.0001
	Yes	22	16.9%		
H/O PID	No	107	82.3%	10.4189	<0.0001
	Yes	23	17.7%		
Pre CS	No	75	57.7%	2.4807	0.01314
	Yes	55	42.3%		
Previous BTL	NO	102	78.5%	9.1786	<0.0001
	YES	28	21.5%		
R or UR	Ruptured	98	75.4%	8.1863	<0.0001
	Unruptured	32	24.6%		
Site	Left	72	55.4%	1.7365	0.08186
	Right	58	44.6%		
endometriosis	N	112	86.2%	11.6593	<0.0001
	Y	18	13.8%		
pelvic inflammatory disease	N	107	82.3%	10.4189	<0.0001
	Y	23	17.7%		

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