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Study on Tubal Ectopic Pregnancy after Female Sterilization in a Tertiary Care Hospital

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Abstract

Background: Tubal sterilization is highly effective and possibly the most popular method of fertility control all over the world. Ectopic pregnancy can occur following tubal sterilization.

Materials and Methods: A cross-sectional prospective study among 28 cases of ectopic pregnancy after tubal sterilization was conducted during the study period of 18 months from July 2016 to December 2017 in the Department of Obstetrics & Gynaecology, S.C.B. Medical College & Hospital Cuttack, Odisha, India. Data were analyzed using MS Excel.

Results: Total number of ectopic pregnancies reported were 292, out of which 9.6 % (n=28) cases had sterilization failure. 60.7% of women were in the age group of 26 to 30 years and 39.3% were more than 30 years of age. 75% of cases had 4 -8 weeks of gestational age at the time of admission and in 14.3% of cases the period of amenorrhoea was <4weeks. 78.6% of cases had minilap tubectomy. In 53.6% of cases tubectomy was done in the post partum period, 35.7% had undergone interval sterilization and in 10.7% of cases tubectomy operation was done concurrently during cesarean section. 64.3% of cases presented as ectopic pregnancy within 5 years after sterilization. 32.1% of cases had sterilization done in the hospital set up. 57.1% of cases had Pelvic Inflammatory disease prior to tubal sterilization. All cases presented with hemoperitonium.75% had ampullary rupture, 10.7% had cornual rupture and 14.3% of the cases revealed tubal abortion.

Conclusion: Although tubal sterilization is highly effective, the risk of pregnancy varies by age, timing and method of tubal occlusion**.** Every woman in the reproductive age group should be counseled at the time of tubal sterilization regarding possibility of Ectopic pregnancy even in the absence of amenorrhoea. Proper selection of cases and correct surgical technique can reduce failure rate.

Keywords: Ectopic pregnancy, Female, Minilap, sterilization, Tubal

Introduction

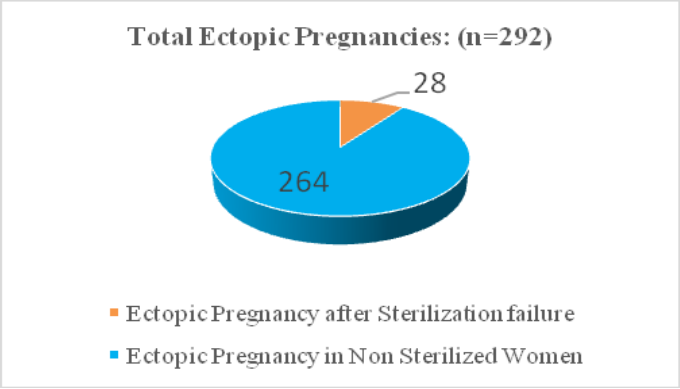
Ruptured ectopic pregnancy is a medical emergency and contributes to be an important cause of maternal death. [1] Voluntary sterilization possibly the most popular method of fertility control all over the world. Worldwide female sterilization is used by 33% of married women using contraception. [2] Tubal ligation is approximately 99% effective in the first year following the procedure. [3] The effectiveness may be reduced slightly later on since the fallopian tubes can in some cases reform or reconnect or formation of tubo-peritoneal fistula, the opening of which are large enough for passage of sperm but too small to allow an ovum to pass through resulting in fertilization and implantation in fallopian tube. Rock et al suggested that the development of tubo- peritoneal fistula subsequent to sterilization was associated with the development of endometriosis especially when the ligation site was within 4 cm of the cornu. The focal endometriosis might then be considered as a possible point for implantation. [4] Method of failure is difficult to detect, except by subsequent pregnancy. Tubal sterilization may be performed via laparotomy, laparoscopy, hysteroscopy or colpotomy. It can be classified into interval, post partum or concurrent depending on the time of sterilization operation. Though ectopic pregnancy may occur many years after tubal sterilization the greatest risk occurs in first two years. The risk of having post sterilization ectopic pregnancy depends on sterilization technique adopted, expertisation of the operating surgeon, timing of performing surgery and age of the women at the time of sterilization. Post sterilization ectopic pregnancy occurring for more than 10% of all ectopic pregnancies.[5,6] The present study was conducted to evaluate in detail the post sterilization ectopic pregnancies.

Materials and Methods

A cross-sectional prospective study was conducted over a period of 18 months, from July 2016 to December 2017 in the Department of Obstetrics and Gynaecology, S.C.B. Medical College and Hospital Cuttack, Odisha, India. Total number of ectopic pregnancies reported was 292, out of which 28 cases had sterilization failure. A detail evaluation was done of those 28 post sterilization ectopic pregnancy cases regarding age of the women, period of gestation, parity, timing of sterilization, technique used for sterilization, interval between sterilization to pregnancy, any past history suggestive of pelvic inflammatory disease, place of operation and intraoperative finding like site of ectopic pregnancy, ruptured or not. Data of those various variables in this study were analyzed using MS Excel.

Results

During the study period total numbers of ectopic pregnancies admitted were 292. Among them 28 cases had undergone tubal sterilization procedure. Thus the incidence of post sterilization ectopic pregnancy is 9.6%.



Out of 28 cases 60.7% of women were in the age group of 26 to 30 years. 39.3% were more than 30 years of age [Table 1].

Table 1: Distribution of post sterilization ectopic pregnancy cases according to the age

Age in years	No	Percentage
26-30 years	17	60.7%
31-35 years	6	21.4%
>35 years	5	17.9%
Total	28	100%

22 cases i.e. 79% were Para 2 and 21% belonged to Para 3 and above [Table-2].

Table 2: Distribution as per parity

Parity	No	Percentage
Para-2	22	79%
Para-3 & above	6	21%
Total	28	100%

Majority of the cases (75%) had 4 -8 weeks of gestational age at the time of admission and 14.3% cases had <4 weeks period of amenorrhoea [Table 3].

Table 3: Period of gestation

Period of gestation	No	Percentage
<4 weeks	4	14.3%
4- 8 weeks	21	75%
>8 weeks	3	10.7%
Total	28	100%

78.6% of post sterilization ectopic pregnancy had history of minilap method of tubectomy and rest 21.4% had laparoscopic tubal ligation [Table 4].

Table 4: Methods of tubal sterilization

Methods	No	Percentage
Minilap	22	78.6%
Laparoscopic tubal ligation	6	21.4%
Total	28	100%

In 53.6% of cases tubectomy was done in the post partum period, 35.7% had undergone interval sterilization i.e. 6 weeks after child birth and in 10.7% of cases tubectomy operation was done concurrently during cesarean section[Table 5].

Table 5: Timing of tubal sterilization

Timing	No	Percentage
Interval	10	35.7%
Post-partum	15	53.6%
Concurrent(during C-section)	3	10.7%
Total	28	100%

In this study 64.3% of cases presented as ectopic pregnancy within 5 years after sterilization and 10.7% of cases the interval period between sterilization and ectopic pregnancy was more than 10 years [Table-6].

Table 6: Interval between sterilization and ectopic pregnancy

Interval in years	No	Percentage
1-2 years	6	21.4%
2-5 years	12	42.9%
5-10 years	7	25%
>10years	3	10.7%
Total	28	100%

Among the post sterilization ectopic pregnancies cases majority underwent sterilization operation at the camp and 32.1% of cases had sterilization operation done in the hospital set up [Table-7].

Table7: Place of sterilization operation done

Place	No	Percentage
At Camp	19	67.9%
In Hospital set up	9	32.1%
Total	28	100%

57.1% of cases had symptoms suggestive of Pelvic Inflammatory disease prior to tubal sterilization [Table 8].

Table 8: Symptoms suggestive of Pelvic Inflammatory Disease (PID)

PID symptoms	No	Percentage
Yes	16	57.1%
No	12	42.9%
Total	28	100%

Culdocentesis was positive in all of those 28 cases at the time of admission. All of the admitted post sterilization

ectopic pregnancies cases had undergone emergency laparotomy and salpingectomy operation as all of them presented with disturbed ectopic pregnancies having haemoperitonium.75% of the cases had ampullary rupture, 10.7% had rupture of the tube in the cornual region and 14.3% of the cases revealed tubal abortion [Table 9].

Table 9: Intra operative finding (site of tubal rupture/ abortion)

Site	No	Percentage
Ampullary rupture	21	75%
Cornual rupture	3	10.7%
Tubal abortion	4	14.3%
Total	28	

Discussion

In this study post sterilization tubal ectopic pregnancies accounted for 9.6% of all the ectopic pregnancies got admitted during the study period which is comparable to the observation made by Davis MR, Wolf GC and Chakravarti S. [5, 6 & 7] According to Tatum and Schmidt overall incidence of ectopic pregnancy after tubal sterilization is about 16%. [8] However study done by M Rajani et al in 2005 in IMCH, Calicut revealed prior sterilization as risk factor in 22.7% of cases of ectopic pregnancy. [9] 60.7% of cases occurred in the age group of 26 -30 years. Trussel J et al and Peterson HB et al in their study also observed that the maximum cases occurred in <30 years of age. [10, 11]In our study 14.3% of cases of post sterilization ectopic pregnancy had <4weeks period of secondary amenorrhoea which indicates that even in the absence of amenorrhoea differential diagnosis of ectopic pregnancy should be kept in mind in women in the reproductive age group having symptom of pain abdomen. Arora R et al from JIPMER, Pondicherry reported absence of amenorrhoea in 23% cases of ectopic pregnancy. [12] We found 75% cases of post sterilization ectopic pregnancy presented in the gestational age of 4 -8 weeks which is comparable to observation made by Nahalil KV et al. [13]

Our study revealed 79% of post sterilization ectopic pregnancies were Para-2 and 21% were Para-3 and above. 78.6% of cases adopted minilap method of sterilization particularly modified Pomeroys technique and rest 21.4% had history of laparoscopic tubal ligation which is comparable to study done by Nahalil KV et al. [13] The high failure rate following modified Pomeroys technique may be due to its widely used method of female sterilization in India though this technique per se has low failure rate. In our study the incidence of post sterilization ectopic pregnancy where tubectomy was performed during post partum period was 53.6% which is higher comparable to cases who had undergone interval sterilization. According to Nahalil KV etal 55% of sterilization failure ectopic pregnancies had history of post partum sterilization which is comparable to our observation. [13]This is because the oedematous, friable and congested fallopian tubes following pregnancy increases the chance of incomplete occlusion of the tubal lumen. [14] 16 out of 28 cases (57.1%) had symptoms suggestive of Pelvic Inflammatory disease prior to tubal sterilization. The Presence of Pelvic inflammatory disease prior to tubal sterilization is an important predisposing factor for occurrence of ectopic pregnancy and increases its risk by 3.3 to 6 fold. [15] So early detection of reproductive tract infections and its prompt treatment is highly essential for reduction in the incidence of ectopic pregnancy.

Major determinant of risk of sterilization failure and subsequent pregnancy is the procedural technique. [16, 17] Majority i.e. 64.3% of the cases presented as ectopic pregnancy within 5 years of tubal sterilization. Cheng et al

also observed 53% of ectopic pregnancy occurred between 2 -5 years of sterilization. [18] According to J P Shah et al ectopic pregnancy occurred more than a year after tubal sterilization in 84.6% of cases. [19]

We observed ampulla was the most common site of ectopic pregnancy following tubal sterilization which accounted for 75% of the cases. 14.3% of cases had tubal abortion which was noticed during laparotomy. Sarella LK and Peterson etal in their study observed ampulla was the most common site of tubal ectopic pregnancy. [20, 21]

Conclusion

Though tubal sterilization is considered to be the widely choiced and permanent method of family planning still it has failure rate of 0.13 to 1.3% and if pregnancy occurs following tubectomy or tubal ligation diagnosis of both intrauterine and ectopic pregnancy has to be kept in mind.

Ectopic pregnancy is like" black cat in the dark night". So high index of suspicion is needed to diagnose it in any women in reproductive age group having pain abdomen irrespective of presence or absence of amenorrhoea and whether she has undergone tubal sterilization or not. No specific sign or symptom can be said to be pathognomonic of ectopic pregnancy. The classical triad of amenorrhoea, pain abdomen and vaginal bleeding may not be seen in all cases. Many studies revealed absence of amenorrhoea does not rule out the possibility of ectopic pregnancy.

Age at sterilization, time of sterilization, technique followed and interval between sterilization & ectopic pregnancy are important risk factors for occurrence of post sterilization ectopic pregnancy.

Presence of Pelvic inflammatory disease prior to tubal sterilization is an important predisposing factor for occurrence of ectopic pregnancy and increases its risk by 3.3 to 6 fold which suggests early detection of reproductive tract infections and its prompt treatment is highly essential.

Failure can be prevented by proper selection of cases, timing, adequate anesthesia, proper identification of both the tube and adopting meticulous surgical technique by trained surgeon particularly while doing tubectomy in post MTP and post partum cases.

Interval sterilization should be done in proliferative phase of the menstrual cycle and pregnancy should be reasonably ruled out before proceeding for tubal sterilization. One should ensure complete occlusion of the fallopian tube at proper site at the end of laparoscopic sterilization. Bilateral salpingectomy should be done at the time of surgery for an ectopic pregnancy that occurred following sterilization operation. Sterilization operations at camp had more chance of failure resulting in the form of disturbed ectopic pregnancies. Sterilization operations at camp still remains a target oriented approach rather than attempting at providing quality care. Our goal should therefore to provide client and quality service rather than as a mission to achieve the targets set up at Government level.

Last but not the least, women adopting tubal sterilization as a method of contraception must be aware of its failure resulting in both intra uterine and ectopic pregnancy.

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References

1. Brenner PF, Bendetti T, Mishell DR Jr. Ectopic pregnancy following tubal sterilization surgery.Obstet Gynecol. 1977; 49(3):323-4
2. Chan LM, Westhoff CL. Tubal sterilization trends in the United States. Fertil. Steril.2010; 94(1)1-6
3. Family Planning Worldwide-2008 Data Sheet. Data Form Surveys; 1997-2007.Washington, DC: Population Reference Bureau. 2008:06-27.
4. Rock JA, Parmley TH, King TM, Laufe LE, Su BS. Endometriosis and the development of tubo peritoneal fistula after tubal ligation. Fertil Steril 1981; 35(1):16-20
5. Davis MR. Recurrent ectopic pregnancy after tubal sterilization. Obstet Gynecol.1986; 68(3 suppl):44S-45S
6. Wolf GC, Thompson NJ. Female sterilization and subsequent ectopic pregnancy. Obstet Gynaecol.1980;55(1):17-9
7. Chakravarti S, Shardlow J. Tubal pregnancy after sterlisation.Br J Obstet & Gynaecol.1957; 82(1):58-60
8. Tatum HJ, Schmidt FH. Contraceptive and sterilization practice and extrauterine pregnancy: a realistic perspective. Fertil Steril 1977; 28(4):407-21
9. Rajani M, Jayasree S, Srinivasa SK.Astudy on the epidemiology of ectopic pregnancy in a tertiary care centre in north Kerala. J. Evid. Based Med & Health Care. 2014; 1(6):435-44.
10. Trussel J, Guilbert E, Hedley A. Sterilization failure, sterilization reversal and pregnancy after sterilization reversal in Quebec. Obstet Gynecol.2003; 101(4):677-84
11. Peterson HB, Xia Z, Hughes JM, Wilcox LS, Tylon LR, Trussell J. The risk of pregnancy after tubal sterilization: Findings from U.S. Collaborative Review of Sterilization. Am J Obstet Gynecol.1996; 174(4):1161-8
12. Arora R, Rathore AM, Habeebullah S, Oumachigui A. Ectopic pregnancy -changing trend. J Indian Med Asso.1998; 96(2):53-4, 57
13. Nhalil KV, Maroli R, Menon NS, Joy R.Post sterilization ectopic pregnancy in a tertiary care centre in North Kerala. J of Evid. Based Med & Health Care. 2017; 4(19):1067-1071
14. Sivanesaratnam V, Ng KH. Tubal pregnancies following post-partum sterilization.Fertil Steril.1975; 26:945-946
15. Levin AA, SchoenbaumSC, Stubblefield PG, Zimicki S, Monson RR. Ectopic pregnancy and prior induced abortion.Am J Public Health.1982.72 (3):253-255.
16. Stoval TG, Ling FW, O kelley KR, Coleman SA.Gross and histologic examination of tubal ligation failure in a residency training programme.Obstet Gynaecol.1990;76(3Pt1):461-5
17. Soderstrom RM, Levy BS, Engel T. Reducing bipolar sterilization failures.Obstet Gynecol.1989; 74(1):60-3
18. Cheng MC, Wong YM, Rochat RW, Ratnam SS.Sterilization failures in Singapore: an examination of ligation techniques and failure rates. Stud. Fam Plann.1977;8(4):109-15
19. Shah JP, Parulekar SV, Hinduja IN. Ectopic pregnancy after tubal sterilization. Journal of Postgraduate Medicine.1991; 37(1)17-2
20. Sarella LK. Evaluation of post sterilization ectopic gestation. Int J Reprod Cotracept Obstet Gynaecol.2017; 6:1503-
21. Peterson HB. Sterilization. Obstet Gynecol.2008; 111(1):189-203