AJMAS
https://journal.utripoli.edu.ly/index.php/Alqalam/index *eISSN 2707-7179*

Original article

Ectopic Pregnancy: Incidence, Associated Risk Factors and Complications from Yashfeen Clinic

Enas Benaliwa[1], Amel Morgham[2]*, Nasreen Osman[2], Faisal Ali[3], Laila Almahdi[2], Huda Othman[2], Abdulhafid Abudher[3]

[1]Aljalla Maternity Hospital, Tripoli, Libya.
[2]Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tripoli, Tripoli, Libya.
[3]Yashfeen Clinic, Tripoli, Libya

ARTICLE INFO

Corresponding Email. *amelmorgham@yahoo.com*
Received. *22-08-2022* ***Accepted.*** *03-09-2022* ***Published.*** *06-09-2022*
Keywords. *Pregnancy, Ectopic, Ultrasonography, Diagnosis, Differential, Methotrexate.*

ABSTRACT

Aims*. To explore the risk factors for ectopic pregnancy (EP) in women with planned pregnancy.* ***Methods****. This case series study, which included 147 women with planned pregnancy. In this group matched in terms of mother age, gestational age in weeks, Socio-demographic characteristics, reproductive history, gynecological history, contraceptive use, and history of infertility.* ***Results****. From147 patients diagnosed with EP, the age ranged between 22-49 years with mean age of 33.6 ± 4.2 years. Most patients who had ectopic pregnancy were multigravidas, multiparous, and those with previous history of abortion. 72.4 % of patients with ectopic pregnancy had a history of surgery (53.7% of the patients had previous C/S, 11.6% laparoscopy, 5.4% laparotomy, 3.4% E&C and 2% appendectomy). The result shows that the recurrence rate is 12.6% in those with previous ectopic and the most common site is the left fallopian tube pregnancy with a rate of 51.7%. Ninety-nine (67.3%) of the patients were treated by salpingectomy, 40 (27.2%) treated by salpingectomy. 143/147 (97.2%) of the ectopic pregnancy cases treated with laparoscopic surgical intervention successively and only four patients with scar ectopic pregnancy ended by laparotomy. Only 4.1% need a blood transfusion from all cases of ectopic pregnancies and no record of any maternal death.* ***Conclusion****. The signs and symptoms of EP can be similar to other complications of early pregnancy and the diagnosis often requires ß-hCG level and transvaginal ultrasonography. Once a diagnosis made, treatment options include medical therapy with methotrexate or surgery, which often managed laparoscopically. However, a delay in either diagnosis or treatment can lead to uterine rupture, hysterectomy, and significant maternal morbidity.*

Cite this article. *Benaliwa E, Morgham A, Osman N, Ali F, Almahdi L, Othman H, Abudher A. Ectopic Pregnancy: Incidence, Associated Risk Factors and Complications from Yashfeen Clinic. Alq J Med App Sci. 2022;5(2):447-453*
https://doi.org/10.5281/zenodo.7055138

INTRODUCTION

Ectopic pregnancy is the implantation of a fertilized egg outside the uterine endometrial cavity. Ectopic pregnancy (EP) is the leading cause of maternal mortality in the first trimester of pregnancy [1]. Approximately 1–2% of all naturally conceived pregnancies end up with EP [2] and in approximately 98% of ectopic pregnancies occur in the fallopian tubes [3]. The remaining ectopic pregnancies can be in various locations outside of the fallopian tubes, including the ovary, cesarean section scars, cervix, and peritoneal cavity. Cesarean section scar ectopic pregnancy accounts for less than 1% of ectopic pregnancies [4]. A major risk factor for ectopic pregnancy is pelvic inflammatory disease [5] and other high-risk factors include a previous ectopic pregnancy and tubal surgery. The incidence of ectopic pregnancy is increasing.In 1992, the rate of ectopic pregnancies was 19.7 per 1000 in the USA, which was an increase from 4.5 per 1000 in 1970 [6]. This rise could be attributed to the development of more accurate and sensitive ectopic pregnancy diagnostic techniques, such as high-resolution ultrasound. Ectopic pregnancy-related maternal mortality has been declining; it accounted for 13% of maternal deaths between 1979

and 1986 and for 6% of maternal deaths between 1991 and 1999, with hemorrhage accounting for the majority of these deaths [7]. The most common complication of ectopic pregnancy is rupture, which occurs in 15%-20% of ectopic pregnancies [8]. It can result in a life-threatening hemorrhage and often requires an emergency surgery. This study was aimed to explore the risk factors for ectopic pregnancy (EP) in women with planned pregnancy.

METHODS

Study design and settings

The study is retrospective case series study, conducted in Yashfeen clinic, Tripoli, Libya frame from January 2019 to December 2020. One hundred Forty-seven women enrolled in this study who diagnosed as a case of ectopic pregnancy. EP diagnosis done according to the American College of Obstetricians and Gynecologists Practice Bulletin [9]. ß-hCG level and transvaginal ultrasonography, which shows an empty uterus with or without adnexal mass and free fluid in POD. The diagnosis and the location of EP confirmed intraoperatively in patients who received surgical treatment in managing the EP.

Statistical analysis

Statistical analysis computerized by using the Statistical Program for Social Sciences (SPSS version 23) that used for data entry and analysis. Descriptive statistics used and all results are presented as frequencies and percentages.

RESULTS

The age of 147 women ranged between 22-49 years with mean age of 33.6 ± 4.2 years. 55.8 % of patients were between ages of 31 and 40 years and 27% of them were less than 30 years of age (figure 1). 18% of the patients were primigravidas, 50% were between gravida 2 and gravida 4 and 7% of them more than gravida 7 pregnancies. Furthermore, in only two patients the EP pregnancy occurred in the 10th pregnancy or more. (Figure 2).

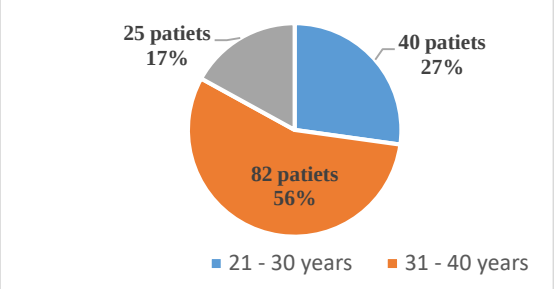

Figure 1. Age distribution of EP patients

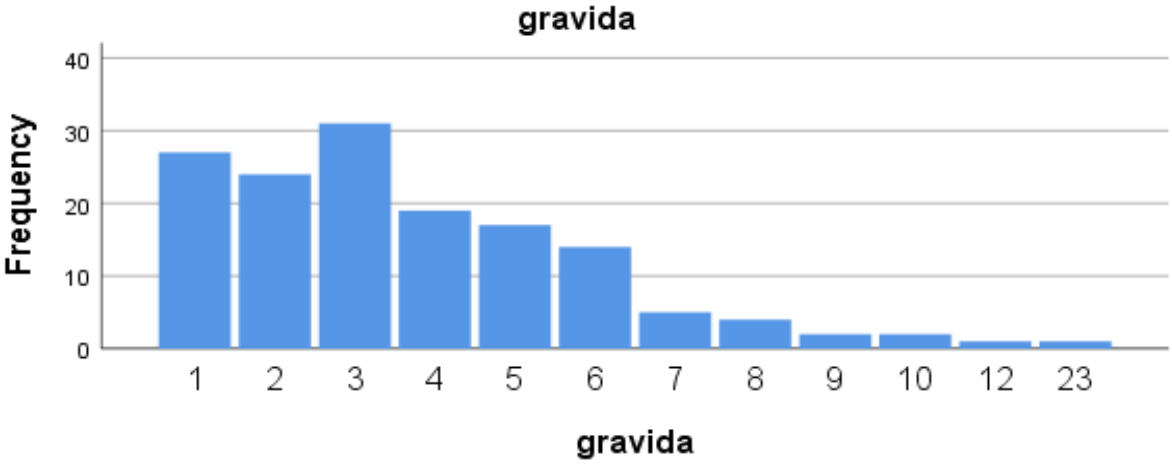

Figure 2. Gravidity distribution among patients with EP

When we analyzing the data regarding the parity, we found that 54% of the patients were multiparous and 29.3% were nulliparous (Table 1). In addition, 56 (38.1 %) of the patients presented history of abortion and the abortion frequency ranged between 1 to 8 times.

Table 1: Parity distribution of EP patients

Parity	number of patients	Percentage
0	43	20.3
1	25	17
2	35	23.8
3	20	13.6
4	18	12.2
5	3	2
6	2	1.4
7	1	0.7
Total	147	100%

This study documented that 19 (12.9%) patients presented with history of previous ectopic pregnancy. In addition, 37 (25.2%) of the patients had previous surgery (Table 2).

Table 2. Types of previous surgical operation in EP patients

Type of surgical operation	Number of patients	Percent (%)
Laparoscopic operation	17	11.6%
Laparotomy	8	5.4%
E&C	5	3.4%
Appendectomy	3	2%
Other operations	4	2.7%
No surgery	110	74.8%

Ninety-four (64%) of the women presented with abdominal pain alone or in association with vaginal bleeding and only 25 (17%) of the patients presented with vaginal bleeding. In addition, 28 (19%) of the patients diagnosed accidently.

The diagnosis of ectopic pregnancy confirmed in 27.2% of the patients at gestational age between 1 and 5 weeks whereas the major part of the patients (56.5%) diagnosed at gestational age between 6 and 8 weeks (Table 3). Furthermore, in those patients diagnosed with EP, the level of ß-hCG at the time of diagnosis ranged between 73 IU and 59300 IU with normal level of ß-hCG is less than 25 mIU/mL (Table 4).

Table 3. Gestational age at diagnosis of ectopic pregnancy

Gestational age	Number of patients	Percent (%)
1 – 5 weeks	40	27.2%
6 – 8 weeks	83	56.5%
9 -12 weeks	20	13.6%
>13 weeks	4	2.7%
Total	147	100%

Table 4: ßHCG levels in EP patients at time of diagnosis

ß-hCG level (mIU/mL)	Number of patients	Percent (%)
< 1000	45	30.6%
1000 - 3000	25	17%
3000 – 10.000	52	35.4%
>10.000	25	17%
Total	147	100%

We found that ectopic pregnancy localized in fallopian tubes in most of the patients. Where, 51.7% was implanted in left fallopian tube, 44.2% of the patients was implanted in right fallopian tube, in 5 (3.4%) patients were implanted in previous surgical scar and only 1 (0.7%) patient was cervical ectopic pregnancy.
For EP management, 99 (67.3%) were treated by salpingectomy, 40 (27.2%) treated by salpingostomy (Table 5). In addition, only 6 (4.1%) of EP patients needed blood transfusion in sequence of treatment of EP and no maternal mortality recorded.

Table 5: Type of treatment of EP

Type of treatment	Number of the patients	Percent (%)
left salpingectomy	50	34%
right salpingectomy	49	33.3%
left salpingostomy	25	17%
right salpingostomy	15	10.2%
Milking of EP	2	1.4%
remove EP from cervix	1	0.7%
remove EP from surgical scar	5	3.4%
Total	147	100%

Regarding the surgical approach, 143/147 (97.2%) of the ectopic pregnancy cases were managed successively by laparoscopy whereas the other four patients ended by laparotomy ($p < 0.05$).

DISCUSSION

The general incidence of single ectopic pregnancy about 2% of pregnancies [6]. About 2.2 to 4.5% more ectopic pregnancies occur after different types of assisted reproductive technology (ART) cycles than they do after spontaneous conception, according to research reviewed in the literature [10,11]. In our study, major part of EP patients (55.8 %) were between 31 and 40 years and 27% of them were less than 30 years of age. In literature, the risk of ectopic pregnancy increases with advancing maternal age, with age over 35 years being a significant risk factor [1]**.** A 3 to 4-fold increase in the risk of developing an ectopic pregnancy exists compared with women aged 15-24 years. The Fallopian tube is the common site in most our cases of EP (96%) of the patients which is similar to previous studies, about 75–80% of EPs occur in ampullary portion, 10–15% in isthmic portion, and about 5% in the fimbrial end of the Fallopian tube [12,13]. In our study, we found only one patients (0.7%) with cervical EP which rare and represents only 0.15% of all EPs [14] and we do not diagnosis any patient with ovarian EP. The incidence of the ovarian EP, one of the rarest types, is believed to be 0.15–3% of all diagnosed EP cases [15] and one in every nine ectopic pregnancies among intrauterine device (IUD) users is an ovarian pregnancy [16,17]. The major part of our patients (56.5%) diagnosed at gestational age between 6-8 weeks and 27% diagnosed before 5th gestational age where most of them (64%) presented with abdominal pain in association with vaginal bleeding. This is similar because patients with an ectopic pregnancy commonly present with pain and vaginal bleeding between 6 and 10 weeks' gestation [18-20]. Across a wide variety of mother ages and ethnic origins, ectopic pregnancy occurs about as frequently, and early detection is essential to prevent more serious problems and urgent invasive operations [21]. Analyzing risk factors, we found that 37 (25.2%) of the patients had previous surgery including laparoscopic, laparotomy, E&C and appendectomy. In addition, 12.9% of the patients had previously

ectopic pregnancy. Various risk factors for ectopic pregnancy have been identified, including previous ectopic pregnancy, previous pelvic surgery, induction of ovulation, intrauterine device usage, history of pelvic inflammatory disease, and smoking at the time of conception [1,22-25]. The treatment used in our patients, 99 (67.3%) were treated by salpingectomy, 40 (27.2%) treated by salpingostomy which is similar to literature. The surgical treatment by laparotomy or laparoscopy, and medical treatment is usually systemic or local route, or by expectant treatment. Vineeta G et al [26], from 56 EP patients documented that salpingectomy was done in 37.4%, salpingo-oophorectomy in 46.3% and total abdominal hysterectomy in done in 7.1% of EP patients. In an effort to maintain fertility on that side, an ectopic pregnancy is removed by dissecting it out of the tube and leaving the Fallopian tube in place [27]. Salpingectomy has a 92% success rate, and methotrexate (MTX) can be used to treat failure instances [28]. The most popular and effective medical treatment for ectopic pregnancy is intramuscular methotrexate, which is often given as a single dosage. Patients who have an unruptured tubal ectopic pregnancy who are hemodynamically stable, with few symptoms, and who have a little amount of free intraperitoneal fluid on ultrasound scan can benefit from it [29]. The most frequent side effect of laparoscopic salpingostomy, persistent EP is caused when trophoblastic tissue is not completely removed [30]. It occurs in 5-20% of cases [31.32]. When once-weekly measured -hCG concentrations reach a plateau or increase, it is diagnosed during follow-up [33]. NICE [34] recommended that women undergoing salpingostomy have a serum ß-hCG level taken 7 days after surgery and then weekly until a negative result is obtained. ß-hCG level of less than 5 mIU/mL is considered negative for pregnancy. In literature, in EP patients presented with abdominal pain or bleeding, the minimum rise in ß-hCG was 24% at 24 hours and 53% at 48 hours [35]. We not recorded any maternal death. In the UK, ectopic pregnancy remains the leading cause of pregnancy-related first trimester death (0.35/1000 ectopic pregnancies) [1,36]. However, in the developing world it estimated that 10% of women admitted to hospital with a diagnosis of ectopic pregnancy ultimately die from the condition [37]. Prior to Shapiro and Adler's introduction of the laparoscopic method in 1973, laparotomy was the usual surgical procedure [38]. Three prospective randomized trials have shown that a laparoscopic method is superior than a laparotomy in terms of less blood loss, the need for painkillers, the length of hospital stay, and the cost [39,40]. In our study, 97% of the ectopic pregnancy managed by laparoscopic surgical intervention whereas only four patients managed by laparotomy. In literature, many studies demonstrate the efficacies and benefit of the laparoscope in treatment of the ectopic pregnancy with incidence rate 50% of the ectopic pregnancy treated with laparoscopic intervention [41,42].

CONCLUSION

This study describes the risk factors, diagnosis, and management of tubal and non-tubal ectopic pregnancy. As ectopic pregnancy is common in reproductive age group. The ectopic pregnancy was significantly related to the previous history of ectopic pregnancy, abortion and caesarean section. With the use of ß-hCG level and transvaginal ultrasonography, most of ectopic pregnancies can be diagno+sed and treated at an early stage in stable patients is often medical, but in patients with ectopic pregnancy outside the fallopian tube may require differing and/or more invasive treatment, including excision by laparoscopy or laparotomy. It should not be missed in extremes of age and should be suspected in women with risk factors. In addition, our study demonstrates the safety and efficacy of laparoscopic surgery for ectopic pregnancies.

Acknowledgements

The authors would like to thank Yashfeen Clinic Team for their cooperation and support during study period.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

References:

1. Farquhar CM. Ectopic pregnancy. Lancet 2005;366:583–91.
2. Shaw JL, Dey SK, Critchley HO, Horne AW. Current knowledge of the etiology of human tubal ectopic pregnancy. Hum Reprod Update 2010;16:432–44.
3. Bouyer J, Coste J, Fernandez H, Pouly JL,Job-Spira N: Sites of ectopic pregnancy: a 10 year population-

based study of 1800 cases. Hum. Reprod,2002. 17(12), 3224–3230.
4. Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. Firsttrimester diagnosis and management of pregnancies implanted into the lower uterine segment Cesarean section scar. Ultrasound Obstet Gynecol 2003;21:220-227.
5. Goldner TE, Lawson HW, Xia Z, Atrash HK. Surveillance for ectopic pregnancy: United States, 1970-1989. MMWR CDC Surveill Summ 1993;42:73-85
6. Centers for Disease Control and Prevention: Ectopic pregnancy – United States, 1990–1992. JAMA:1995,273(7), 533.
7. Chang J, Elam-Evans LD, Berg CJ, Herndon J, Flowers L, Seed KA, Syverson CJ. Pregnancy-related mortality surveillance--United States, 1991--1999. MMWR Surveill Summ. 2003 Feb 21;52(2):1-8. PMID: 12825542.
8. Job-Spira N, Fernandez H, Bouyer J, Pouly JL, Germain E, Coste J. Ruptured tubal ectopic pregnancy: risk factors and reproductive outcome: results of a population-based study in France. Am J Obstet Gynecol 1999;180:938-944.
9. ACOG Practice Bulletin No. 191: Tubal Ectopic Pregnancy. Committee on Practice Bulletins—Gynecology. Obstet Gynecol. 2018 Feb;131(2):e65-e77.
10. Marcus SF, Brinsden PR. Analysis of the incidence and risk factors associated with ectopic pregnancy following in-vitro fertilization and embryo transfer. Human Reproduction, 1995:10(1);199–203.
11. Bu Z, Xiong Y, Wang K, Sun Y. Risk factors for ectopic pregnancy in assisted reproductive technology: a 6-year, single-center study. Fertil Steril. 2016 Jul;106(1):90-94. doi: 10.1016/j.fertnstert.2016.02.035. Epub 2016 Mar 18. PMID: 27001382.
12. Condous G. The management of early pregnancy complications. Best Practice & Research. Clinical Obstetrics & Gynaecology. 2004;18:37-57
13. Ackerman TE, Levi CS, Dashefsky SM. Interstitial line: Sonographic finding in interstitial (corneal) ectopic pregnancy. Radiology. 1993;189:83-87
14. Webb EM, Green GE, Scott LM. Adnexal mass with pelvic pain. Radiologic Clinics of North America. 2004;42:329-348
15. Odejinmi F, Rizzuto MI, MacRae R, Olowu O, Hussain M. Diagnosis and laparoscopic management of 12 consecutive cases of ovarian pregnancy and review of literature. Journal of Minimally Invasive Gynecology. 2009;16:354-359
16. Hallet JG. Primary ovarian pregnancy. A case report of twenty-five cases. American Journal of Obstetrics and Gynecology. 1982;143(1):55-60
17. Grimes H, Nosal RA, Gallagher JC. Ovarian pregnancy. A series of 24 cases. Obstetrics and Gynecology. 1983;61:174-180
18. Walker JJ. Ectopic pregnancy. Clin Obstet Gynecol. 2007;50:89–99.
19. Xiao GH, Chen DJ, Sun XF, She RQ, Mai YM. Abdominal pregnancy: full-term viable baby. Eur J Obstet Gynecol Reprod Biol 2005;118:117-8
20. Ramachandran K, Kirk P. Massive hemorrhage in a previously undiagnosed abdominal pregnancy presenting for elective cesarean delivery. Can J Anaesth 2004;51:57-61.
21. Plotti F, Di GA, Oliva C, Battaglia FG. Bilateral ovarian pregnancy after intrauterine insemination and controlled ovarian stimulation. Fertility and Sterility. 2008;90:2015.e3-2015.e5
22. Bouyer J, Coste J, Shojaei T, Pouly JL, Fernandez H, Gerbaud L, et al. Risk factors for ectopic pregnancy: a comprehensive analysis based on a large case-control, population-based study in France. Am J Epidemiol. 2003;157(3):185–194.
23. Marchbanks P, Annegers JF, Coulam CB, Strathy JH, Kurland LT. Risk factors for ectopic pregnancy.A population based-study. JAMA. 1988;259(12):1823–1827.
24. Ankum WM, Mol BW, Van der Veen F, Bossuyt PM. Risk factors for ectopic pregnancy: A meta-analysis. Fertil Steril. 1996;65(6):1093–1099.
25. Mol BW, Ankum WM, Bossuyt PM, van der Veen F. Contraception and the risk of ectopic pregnancy: a meta-analysis. Contraception 1995;52:337-41.

26. Vineeta G, Geetika G, Rajni G, Savita B, Jaya C. Conventional surgical management of ectopic pregnancy in remote areas. The Journal of Obstetrics and Gynecology of India. 2007;57:142-144
27. Sivalingam VN, Duncan WC, Kirk E, Shephard LA, Horne AW. Diagnosis and management of ectopic pregnancy. The Journal of Family Planning and Reproductive Health Care. 2011;37:231-240
28. Hajenius PJ, Mol BW, Bossuyt PM, Ankum WM, Vander VF. Interventions for tubal ectopic pregnancy. Cochrane Database of Systematic Reviews. 2000;2:CD000324
29. Lipscomb GH, McCord ML, Stovall TG, Huff G, Portera SG, Ling FW. Predictors of success of methotrexate treatment in women with tubal ectopic pregnancies. The New England Journal of Medicine. 1999;341:1974-1978
30. Hoppe DE, Bekkar BE, Nager CW. Single-dose systemic methotrexate for the treatment of persistent ectopic pregnancy after conservative surgery. Obstetrics and Gynecology.1994;83:51-54
31. Buster JE, Carson SA. Ectopic pregnancy; new advances in diagnosis and treatment. Current Opinion in Obstetrics & Gynecology. 1995;7:168-176
32. Graczykowski JW, Mishell DR. Methotrexate prophylaxis for persistent ectopic pregnancy after conservative treatment by salpingostomy. Obstetrics and Gynecology. 1997;89:118-122.
33. Rana P, Kazmi I, Singh R, Afzal M, Al-Abbasi FA, Aseeri A, Singh R, Khan R, Anwar F. Ectopic pregnancy: A review. Archives of Gynecology and Obstetrics. 2013;288:747-757.
34. National Institute for Health and Care Excellence (NICE). Ectopic pregnancy and miscarriage. Diagnosis and initial management in early pregnancy of ectopic pregnancy and miscarriage. In: NICE Clinical Guideline 154, NICE Publisher, UK, 2012
35. Silva C, Sammel MD, Zhou L, Gracia C, Hummel AC, Barnhart K. Human chorionic gonadotropin profile for women with ectopic pregnancy. Obstetrics and Gynecology. 2006;107:605-610
36. Nama V, Manyonda I. Tubal ectopic pregnancy: diagnosis and management. Arch Gynecol Obstet. 2009;279:443–453.
37. Leke RJ, Goyaux N, Matsuda T, et al. Ectopic pregnancy in Africa: a population-based study. Obstet Gynecol. 2004;103:692–697.
38. Shapiro HI, Adler DH. Excision of an ectopic pregnancy through the laparoscope. Am J Obstet Gynecol. 1973;117:290–1.
39. Lundorff P, Thorburn J, Hahlin M, Källfelt B, Lindblom B. Laparoscopic surgery in ectopic pregnancy. A randomized trial versus laparotomy. Acta Obstet Gynecol Scand. 1991;70:343–8.
40. Murphy AA, Nager CW, Wujek JJ, Kettel LM, Torp VA, Chin HG. Operative Laparoscopy versus laparotomy for the management of ectopic pregnancy: a prospective trial. Fertil Steril. 1992;57:1180–5.
41. Xiang XD, Tane YQ. Treatment of ectopic pregnancy. Singapore Med J 1999; 40(2): 88–90.
42. Duggal BS, Tarneja P, Surg Capt Mrs, Sharma RK, Rath SK, Wadhwa RD. Laparoscopic Management of Ectopic Pregnancies. Med J Armed Forces India. 2004 Jul; 60(3): 220–223.