

How to Cite:

Vanitha, A., Farheen, A., Banupriya, V., & Shaheen, K. (2022). Study on clinical evaluation and management of ectopic pregnancy. *International Journal of Health Sciences*, 6(S2), 14282–14291. <https://doi.org/10.53730/ijhs.v6nS2.8789>

Study on clinical evaluation and management of ectopic pregnancy

Dr Aggu Vanitha

Assistant Professor, Department of Obstetrics and Gynaecology, Government General Hospital, Nizamabad, Telangana

Dr Ayesha Farheen*

Assistant Professor, Department of Obstetrics and Gynaecology, Government General Hospital, Nizamabad, Telangana

*Corresponding author

Dr. V.Banupriya

Assistant Professor, Department of Obstetrics and Gynaecology, Government General Hospital, Nizamabad, Telangana

Dr Kausar Shaheen

Consultant: Department of Obstetrics and Gynaecology, Human touch hospital.

Abstract--Background: After an ectopic pregnancy has been confirmed, treatment options include medical, surgical, or expectant management. For patients who are medically unstable or experiencing life-threatening haemorrhage, a surgical approach is indicated. Aims: To study the clinical presentation, risk factors and treatment modalities of ectopic pregnancy. Materials and methods: This prospective open labelled study carried out among patients attending to Department of Obstetrics and Gynaecology in which 50 cases of diagnosed ectopic pregnancies were analysed over a period of 1 1/2 year. Results: Ectopic pregnancies are most common in women between the ages of 26 -30. Multiparous women have the highest rate of ectopic pregnancies. H/o tubal procedures (tubal ligation) have the highest prevalence. The majority of patients are with a missing period, lower abdomen pain, and vaginal bleeding. In this study, the ampullary component was the most common site of tubal ectopic in 54 percent of cases, the isthmic part in 38 percent, and the fimbrial region was implicated in 8%. In two cases, medical therapy with a single dose regimen failed, whereas in three cases, medical treatment with a multidose regimen failed. Laparotomy is commonly done because most of the patients come in acute condition. Varying amounts of hemoperitoneum is present in maximum number of cases. Massive hemoperitoneum is present in ruptured ectopic cases.

Conclusions: Ectopic pregnancy causes significant morbidity to mother and hence requires a high index of suspicion so that diagnosis can be made early and also to prevent complications & preserve the future reproductive function.

Keywords---ectopic pregnancy, laparotomy, tubal procedures.

Introduction

Ectopic pregnancy was first recognized in 1693 by Busiere while examining body of a prisoner executed in Paris. An ectopic pregnancy is one in which blastocyst is implants anywhere other than the endometrial lining of uterine cavity.¹ Pregnancies in fallopian tube accounts for 95-96%, in that 70% in ampulla, 12% in isthmus, 11% in fimbria, 1% in abdominal cavity, 3% in ovary, <1% in cervical and <1% in caesarean scar. Incidence of ectopic pregnancy is 2% of reported pregnancies (according to CDC)² The frequency with which ectopic pregnancy presents in the gynaecological department , the disparity of its signs ,symptoms and intricacies in its diagnosis has made ectopic pregnancy both an interesting and challenging problem. This study is aimed to find the incidence of ectopic pregnancy in the study population and to evaluate the symptomatology and clinical presentation, to analyse the treatment modalities like medical and surgical, morbidity, mortality occurring in these patients.

Materials and Methods

This prospective open labelled study carried out among patients attending at department of Obstetrics and Gynaecology in Modern Government Maternity Hospital, Petlaburz, under Osmania Medical College, Hyderabad. In this study 50 cases of ectopic pregnancies were analysed over a period of 1 1/2 year from 2020 Jan to 2021 June.

Inclusion Criteria: All diagnosed cases of ectopic pregnancies.

Exclusion Criteria: All intrauterine pregnancies.

All patients with a history suggestive of ectopic pregnancy and in whom diagnosis was confirmed by clinical acumen, ultrasound or direct observation at laparotomy are included in the study. The case sheets of the patients with ectopic pregnancy were traced through the labour ward registers and operation theatre registers. Information regarding the total number of deliveries in the study period, details of demographic characteristics, clinical symptoms and signs, diagnostic tools used, treatment, risk factors for the ectopic pregnancy as well as associated morbidity and mortality were obtained. All the surgeries were done by laparotomy and spinal/general anaesthesia was used in all the cases. This retrospective analysis was done to determine the incidence, clinical features, risk factors, treatment and morbidity and mortality associated with ectopic pregnancy in a tertiary care teaching hospital.

Raw data was entered into a Microsoft excel spreadsheet. The qualitative data were presented in the form of numbers and percentages. Tables and graphs are plotted as per requirement using Microsoft excel.

Results

Table 1: Depending on demographic details

| Age (yrs) | Number of ectopic Pregnancies | Total percentage |
|------------------|-------------------------------|------------------|
| 18-25 | 18 | 36% |
| 26-30 | 30 | 60% |
| 31-44 | 2 | 4% |
| total | 50 | 100% |
| Parity | | |
| Nulliparous | 14 | 28% |
| Para 1 | 11 | 22% |
| Para 2 | 15 | 30% |
| Para 3 and above | 10 | 20% |

Maximum incidence of ectopic pregnancies are seen in age groups of 26-30 years. It is noted that maximum number of ectopic pregnancies are seen in multiparous women.

Table-2 : Distribution according to risk factors for ectopic pregnancies

| Risk factors | Number of ectopic Pregnancies | Total percentage |
|-------------------------------|-------------------------------|------------------|
| H/O PID | - | - |
| H/O previous ectopic | 2 | 4% |
| H/O tubal surgeries | 12 | 24% |
| H/O treatment for infertility | 1 | 2% |
| H/O previous abortion | 7 | 14% |
| H/O previous IUCD | - | - |
| H/O OC pills | - | - |
| H/O smoking | - | - |

Maximum incidence is noted in H/o tubal surgeries (tubal ligation).

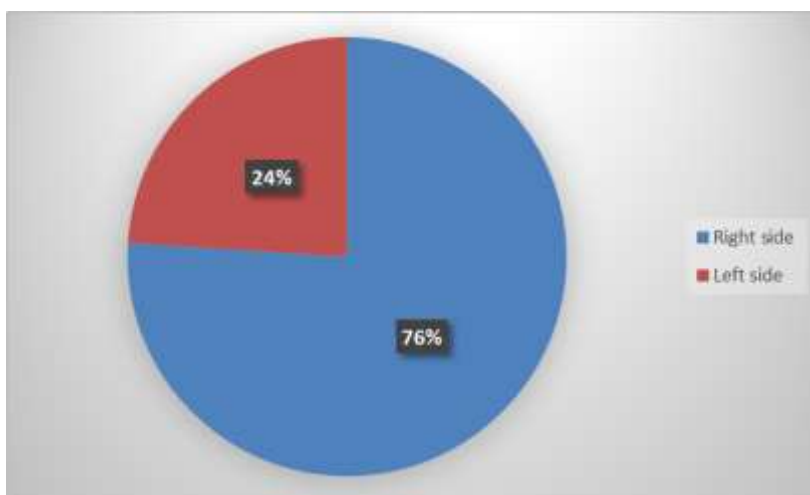
Table-3: Patients presented with more than one complaints

| Chief complaints | Number of ectopic Pregnancies | Total percentage |
|-------------------------------|-------------------------------|------------------|
| Missed period | 50 | 100% |
| Lower abdominal pain | 37 | 74% |
| Bleeding/ spotting per vagina | 16 | 32% |
| Giddiness | - | - |
| Shock | 3 | 6% |

| | | |
|---------------------|---|----|
| Nausea and vomiting | 4 | 8% |
|---------------------|---|----|

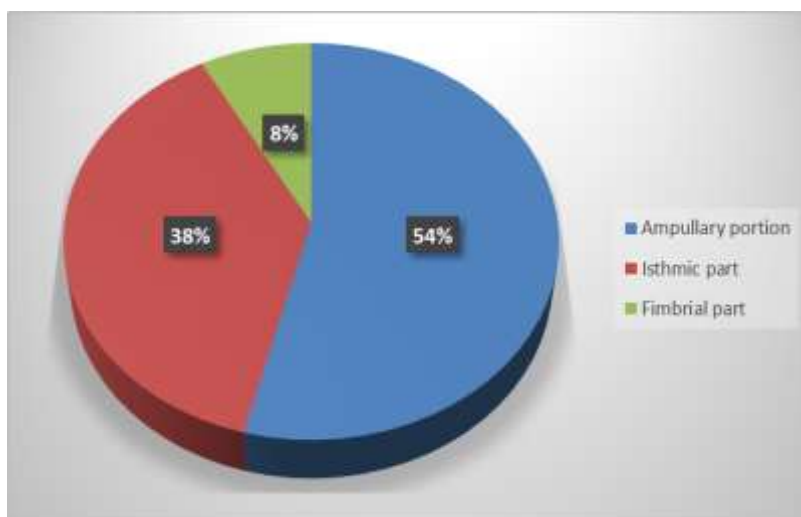
Maximum number of patients presented with missed period, lower abdominal pain and bleeding per vaginum. Commonest signs are pallor in (56%) 28, diffuse abdominal tenderness in (60%)30, cervical motion tenderness in (58%)29, forniceal tenderness and fullness in (52%)26 cases.

Figure-1: Depending upon right and left side of tube



Most commonly right side of the tube is involved.

Figure-2: Area of tube of ectopic pregnancy



A total 50 cases are all tubal ectopic pregnancies. Most common site of tubal ectopic in this study is ampullary portion in 54% cases, isthmic part in 38%, fimbrial part involved in 8% cases

Table-4: Diagnosis in present study

| Methods | Total no. of patients | percentage |
|--------------------|-----------------------|------------|
| UPT positive | 50 | 100% |
| Clinical diagnosis | 28 | 56% |
| Clinical and TVS | 22 | 44% |

In all cases UPT positive and majority of cases diagnosed clinically.

Table-5: Treatment modalities

| Treatment | Total no. of patients | Total percentage |
|----------------------|-----------------------|------------------|
| Medical | 14 | 28% |
| Surgical | 31 | 62% |
| Medical and surgical | 5 | 10% |
| Medical treatment | | |
| Single dose | 2 | 4% |
| Multiple dose | 12 | 24% |
| surgical treatment | | |
| Laparotomy | 28 | 56% |
| laparoscopy | 3 | 6% |

Failed medical treatment with single dose regimen seen in 2 cases, with multidose regimen seen in 3 cases.

Table-6: Depending on intraoperative findings patients divided as follows

| Intraoperative finding | Total no. of cases | Total percentage |
|--------------------------|--------------------|------------------|
| Hemoperitoneum | 37 | 74% |
| Ruptured tubal ectopic | 28 | 56% |
| Unruptured tubal ectopic | 22 | 44% |
| Tubal abortion | - | - |

Varying amounts of hemoperitoneum is present in maximum number of cases. Massive hemoperitoneum is present in ruptured ectopic cases.

Discussion

In this study emphasis is laid on clinical presentation, risk factors, immediate morbidity and mortality associated with ectopic pregnancy and treatment modalities. Maximum incidence (60%) of ectopic pregnancy seen in 26-30 yrs age group, 36% in 18-25 yrs age group, 4% seen in 31-44 yrs age group. Similar report was observed by Mamatha Soren et al³, they reported maximum incidence in 26-30 yrs age (33.3%). Samiya Mufti⁴, Dr. Bandana Pradhan et al⁵ reported maximum incidence in 25-35 yrs age group. Najma Bano Shaikh et al⁶ reported maximum incidence (72%) in 20-30 yrs age group. Prasanna B, Jhansi CB et al⁷

and S Tahmina et al⁸ reported maximum incidence in 21-30 yrs age group. Mridula Shrivastava et al⁹ reported 62% cases in 20-29 yrs age group. Ansa Islam et al¹⁰ reported maximum incidence in 28-32 yrs. Usha Dasari et al¹¹ reported 46% cases in 21-25 yrs age.

Parity distribution of patients according to parity. In this study maximum number of ectopic pregnancies seen in multiparous women (72%) (para1-22%, para 2-30%, para 3 & above -20%) 28% in nulliparous. Similar results observed by Rashmi A Gaddagi et al¹², Najma Bano Shaikh et al⁶, M Sabina Yasmin et al¹³, Prasanna B et al⁷, Mridula Shrivastava et al⁹ and Usha Sri Dasari¹¹. Abdubakar Panti, Nwobodo Emmanuel et al¹⁴ observed 298 cases of ectopics over 9 yrs duration, in that most cases were young nulliparous. Ansa Islam et al¹⁰ observed primigravida 14 (31.3%) 2nd gravida 3rd gravida 4th gravida 5th gravida Grand multi 9 (20%) 5 (11%) 4 (8.8%) 7(15.5%) 6(13.3%).

Risk factors distribution according to risk factors for ectopic pregnancy. In this study maximum risk (24%) is seen in patients with h/o tubectomy, 2nd maximum risk factor with h/o previous abortions (14%), h/o previous ectopis (4%), 56% cases had no identifiable risk factors. H/o treatment of infertility (2%), h/o PID, previous IUCD, OC pills and smoking – nil. Mamatha Soren et al also observed maximum risk with h/o tubectomy (30.5%).H/o D&C (6.9%), PID (5.6%), h/o previous ectopic (1.3%), IUCD (2.7%). Rashmi A Gaddagi¹² reported no identifiable risk factors in most of the cases. Samiya Mufti⁴, reported 55% cases had identifiable risk factors. H/o previous D&C for abortion (21.05%), PID (10%), infertility treatment h/o (8.77%). Dr. Bandana Pradhan et al⁵ reported commonest risk factor (29%) was previous h/o PID. Najma Bano Shaikh et al⁶ reported h/o PID (45%), h/o previous abortion (33%), h/o previous tubal surgeries (20%), 35% cases had no risk factors. Shradhdhan Shetty K et al¹⁵ reported h/o abortion (29%), h/o tubal surgeries (9.6%), h/o infertility treatment (3.2%), h/o PID (3.2%). M Sabina Yasmin et al¹³ reported h/o abortion (10.6%), h/o tubal surgeries (2.2%), h/o infertility treatment (2.2%), PID (4.2%). Prasanna B, Jhansi CB et al⁷ reported 80% of patients had identifiable risk factors of which past h/o PID in 26 %, h/o previous abortion 16%, infertility treatment 10%, uterine anomalies 4%, h/o previous ectopic 6%, usage of IUCD 6%, OCP usage 6%, h/o tubectomy in 6% cases. S Tahmina et al⁸ reported h/o previous abortion (36%), pelvic surgeries (37.5%) and h/o tubectomy in 20.8% cases. Mridula Shrivastava et al⁹ reported no obvious risk factors were identified in 34% cases, h/o previous MTP 17%, previous ectopic 9%, PID 7% as risk factors. Ansa Islam et al¹⁰ reported 45 % had no risk factors, h/o infertility treatment 22%, h/o PID 22%, previous ectopic 4%, previous abdominal pelvic surgeries 6% as risk factors. Ushasree Dasari¹¹ observed risk factors in 79% cases.

Clinical presentation distribution of patients according to symptoms. The commonest symptoms in present study are missed period in 100% cases, next common symptom is lower abdominal pain in 74% cases, bleeding P/V in 32%, shock in 6% and nausea& vomiting in 8% cases. Common signs are pallor in 56%, diffuse abdominal tenderness in 60%, cervical motion tenderness in 58%, forniceal fullness& tenderness in 52% cases. Majority of cases at 6-10 weeks gestational age at presentation. Rashmi A G addagi et al¹² observed lower abdominal pain, amenorrhoea and bleeding per vaginum seen in 50% cases.

Almost half (40%) were in a state of shock at admission. Abubakar Panti, Nwobodo Emmanuel et al¹⁴ observed abdominal pain, amenorrhoea, vaginal bleeding and cervical excitation tenderness were the most common clinical features.

Dr. Bandhana Pradhan et al⁵ observed 80% clinical presentation was abdominal pain, 48% of patients presented in emergency with rupture ectopic in shock. Najma Bano Shaikh et al⁶ observed typical h/o amenorrhoea and abdominal pain was found in 77%, 38% were in a state of shock. Shraddhan Shetty K et al¹⁵ observed commonest symptoms were abdominal pain in 80.6%, amenorrhoea in 77.4%, abnormal vaginal bleeding in 61%. Commonest signs were abdominal tenderness in 64.5%, cervical motion tenderness in 51.6%, adnexal tenderness in 48.4% cases. M. Sabina Yasmin et al¹³ observed commonest symptoms were abdominal pain in 89%, amenorrhoea in 78.7%, bleeding P/V in 63.5%, commonest signs were abdominal tenderness in 70.5%, cervical motion tenderness in 52.6%, adnexal tenderness in 50.4%, almost half (45%) were in a state of shock at admission.

Prasanna B, Jhansi CB et al⁷ observed 96% had amenorrhoea, pain abdomen in 90%, bleeding P/V in 68%, fainting & syncopal attacks in 16%, pallor present in 56% cases, 18% presented with shock. S Tahmina et al⁸ observed lower abdominal pain, amenorrhoea and vaginal bleeding in 40% cases. Mridula Shrivastava et al⁹ observed abdominal pain in 81%, bleeding P/V in 43% cases. Ansa Islam et al¹⁰ observed amenorrhoea in 66%, abdominal pain in 62%, vaginal bleeding in 40%, 22% cases presented in shock. Dr. Vikram Garasia et al¹⁶ observed commonest symptoms were abdominal pain 80.6%, amenorrhoea in 77.4%, vaginal bleeding in 61.3%, commonest signs were abdominal tenderness in 64.5%, cervical excitation tenderness in 51.6%, adnexal tenderness in 64.5% cases. Ushasree Dasari¹¹ observed amenorrhoea in 90%, abdominal pain in 91.6% were the commonest symptoms. Mamatha Soren et al³ observed typical triad of amenorrhoea, pain abdomen and vaginal bleeding in 54% cases.

Distribution according to side of the tube (right or left). In this study right side of the fallopian tube is commonly involved in 76% of cases, left side involved in 32% cases. A total 50 cases are all tubal ectopic pregnancies. Most common site of tubal ectopic in this study is ampullary portion in 54% cases, isthmic part in 38%, fimbrial part involved in 8% cases. Mridula Shrivastava et al⁹ reported 62% ectopic pregnancies were on right side. S Tahmina et al⁸ observed majority (94.4%) were tubal ectopics. Ansa Islam et al¹⁰ reported 62% ectopics on right side, 38% on left side. Commonest site of tubal ectopic was ampulla in 64%, isthmus in 25%, fimbrial portion in 8% cases. Abubakar Panti et al¹⁴ reported ampulla was the commonest site of implantation in 59.7% cases.

In diagnostic methods, in this study urine pregnancy test positive in 100% cases, 28 cases (56%) diagnosed clinically, 22 cases (44%) diagnosed by both clinically and transvaginal ultrasonography. Rashmi A Gaddagi et al¹² used ultrasound, UPT, culdocentesis for the diagnosis of ectopic pregnancy. Abubakar Panti et al¹⁴ reported majority of cases (70%) were already ruptured at time of presentation. Samiya Mufti et al⁴ diagnose by history, clinical examination, UPT, USG, abdominal tap. Most of the patients 60% were diagnosed as ruptured ectopics. S

Tahmina et al⁸ used USG in 38.9% cases. In Ansa Islam et al¹⁰ study, out of 45 cases 23 (51%) were clinically diagnosed, 20 (44%) through abdominal USG, 2 (4.4%) through TVS. Mamatha Soren et al³ used USG in 56 cases. According to type of treatment modalities, types of medical management, types of surgical management. In this study most of cases 31 (62%) treated with surgery (salpingectomy), in that 28 cases (56%) treated by laparotomy, 3 cases (6%) by laparoscopy. 14 cases (28%) treated by successful medical management, in that 2 cases (4%) treated with single dose regimen, 12 cases (24%) treated with multidose regimen. Failed medical management followed by surgical management (laparotomy) seen in 5 cases (10%), in that 2 cases are with single dose regimen, 3 cases are with multidose regimen.

Rashmi A Gaddagi et al¹² treated all the cases by surgically (laparotomy). In Abubakar Panti et al¹⁴ study main mode of treatment was unilateral salpingectomy (76.3%), 3.8% of cases benefited with medical treatment. In Samiya Mufti et al⁴ study, out of 114 cases only one was treated medically, rest all managed surgically. In Najma Bano Shaikh et al⁶ study, 53 cases (88%) treated by laparotomy, 3 cases treated medically, 2 cases treated by laparoscopy, 2 cases were required both laparoscopy proceeded by laparotomy. In Shraddhan Shetty K et al¹⁵ study, 90% cases treated by surgery by open method in the form of salpingectomy, 6.5% cases by salpingoophorectomy, 3.2% cases by salpingostomy. In M. Sabina Yasmin et al¹³, 92% cases treated by surgery by open method in the form of salpingectomy, 5.5% cases by salpingoophorectomy, 2.1% cases by salpingostomy.

In S Tahmina et al⁸ study, 13.8% cases treated medically, 4 cases required surgery for failed medical treatment. In Dr. Vikram Garasia et al¹⁶ study, 90% cases treated by salpingectomy, 6.5% by salpingoophorectomy, 3.2% by salpingostomy. In Ushasree Dasari¹¹ study, 92.5% cases underwent an exploratory laparotomy, 1.8% by laparoscopy, 5.5% cases received medical treatment. In intra operative findings, hemoperitoneum noted in 74% cases, requiring transfusion intraoperatively, ruptured tubal ectopic noted in 56% cases. No postoperative morbidity and mortality noted during study period. Rashmi A Gaddagi et al¹² reported, on laparotomy, majority of cases were ampullary pregnancies followed by interstitial pregnancies, ruptured ectopic seen in 80% cases with hemoperitoneum. Almost all patients had intraoperative, postoperative blood transfusions, no significant postoperative morbidity.

Dr. Bandana Pradhan et al⁵ observed no mortality due to ectopic during study period. Shraddhan Shetty K et al¹⁵ reported anemia in 41.9% cases, requiring blood transfusions in 54.8% cases, no mortality noted. M Sabina Yasmin et al¹³ reported anemia in 50.9% cases, 78% cases requiring blood transfusions, wound infection noted in 2% cases. Prasanna B, Jhansi CB et al⁷ reported 41 cases with ruptured ectopic, 7 were unruptured, 3 were tubal abortion. In S Tahmina et al⁸ study, 59.7% cases requiring blood transfusions, 2.8% cases had transfusion related acute lung injury, no deaths were reported. Mridula Shrivastava et al⁹ reported no mortality during study period. Ansa Islam et al¹⁰ reported 32 cases (71%) were ruptured, 13 cases (28%) were unruptured. Dr. Vikram Garasia et al¹⁶ reported anemia in 41.9%, 54.8% cases required blood transfusion, wound infection noted in 32% cases, no mortality noted. Ushasree

Dasari¹¹ reported postoperative morbidity in the form of wound dehiscence in 11%, paralytic ileus in 5.5, DIC in 3.7 % cases, no mortality noted.

Conclusion

The incidence of ectopic pregnancy is 1- 2%. Any female patient in reproductive age group who presents with h/o missed perio, pain abdomen and spotting or bleeding p/v should be evaluated for ectopic pregnancy with clinical, biochemical and USG examination. Amenorrhoea, abdominal pain are the most consistent features of ectopic pregnancy. Ectopic pregnancy causes significant morbidity to mother and hence requires a high index of suspicion so that diagnosis can be made early and also to prevent complications & preserve the future reproductive function^{17,18}.

It can be diagnosed early by a detailed history, a thorough clinical examination, with the advent of pregnancy test, ultrasonography & diagnostic laparoscopy diagnosis can be made earlier even before rupture of tube & management can be done effectively. Timely treatment of STI in reproductive age group will reduce the incidence of ectopic pregnancy. The treatment depends on condition of the patient, serum beta HCG levels, gestational sac size, ruptured/unruptured, availability of blood products, availability of laparoscopic equipments and also expert surgeon at that time. Methotrexate has proven to be an effective medical management for unruptured tubal ectopic pregnancies where tubal conservation is of utmost importance. medical management offers several benefits over surgical treatment, it is less expensive, less side effects and avoid surgical morbidity. Laparotomy is commonly done because most of the patients come in acute condition.

References

1. Williams gynaecology 3rd edition chapter 7- page no 161.
2. Anonymous , Ectopic pregnancy- United States . 1990-1992. MMWR Morb Mortal Wkly Rep 1995;44:46-48.
3. Soren M, Patnaik R, Sarangi BK. A clinical study on ectopic pregnancy. Int J Res Med Sci 2017;5:4776-82.
4. Samiya Mufti MS et al, an analysis of 114 cases of ectopic pregnancy Jk – practitioner 2012;17(4):20-23.
5. Dr Bandana Pradhan, Prof. L. Ranjit Singh, Prof. N. Nabakishore Singh; A Clinical Study on Ectopic Pregnancy in RIMS from 2013 June- 2015 July; IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 15, Issue 1 Ver. III (Jan. 2016), PP 08-12.
6. Najma Bano sheikh et al, a clinical study of ectopic pregnancy. J Ayub Med Coll Abbottabad 2014;26(2):178-81.
7. Prasanna B, Jhansi CB, Swathi K, Shaik MV. A study on risk factors and clinical presentations of ectopic pregnancy in women attending a tertiary care centre. IAIM, 2016;3(1):90-96.
8. Tahmina S, Daniel M, Solomon P. Clinical Analysis of Ectopic Pregnancies in a Tertiary Care Centre in Southern India: A Six-Year Retrospective Study. J Clin Diagn Res. 2016 Oct;10(10):QC13-QC16.

9. Shrivastava M, Parashar H, Modi JN. A clinical study of ectopic pregnancy in a tertiary care centre in central India. *Int J Reprod Contracept Obstet Gynecol* 2017;6:2485-90.
10. Ansa Islam, Aneesa Fawad et al. Analysis of 2 years cases of ectopic pregnancy. *J Ayub Med coll Abottabad* 2017;29(1):65-7.
11. Dasari, Ushasree. Clinical Analysis of Ectopic Pregnancy in Tertiary Care Hospital. *Journal of Evidence Based Medicine and Healthcare*.2018: 5. 345-348.
12. Rashmi A Gaddagi, AP chandrashekar, a clinical study of ectopic pregnancy *JCDR/2012/4015:2214*.
13. Yeasmin, Most & Uddin, M & Hasan, Enamul. A Clinical Study of Ectopic Pregnancies in a Tertiary Care Hospital of Chittagong, Bangladesh. *Chattagram Maa-O-Shishu Hospital Medical College Journal*.2014:13.3.
14. Abubakar Panti, Abubakar. (2012). Ectopic pregnancy at uduth sokoto a ten-year review. 6. 91-96.
15. Shraddha Shetty K , Anil shetty K. A clinical study of ectopic pregnancies in a tertiary care hospital, Mangalore, India. *Innovative journal of Medical and Health science* 4: 1 Jan-Feb (2014)305- 309.
16. Garasia, Dr.: To Study the Different Clinical Presentations of Ectopic Pregnancy. *Journal of Medical Science and Clinical Research*:2017: 5. 10.
17. Nyandra, M., Kartiko, B.H., Susanto, P.C., Supriyati, A., Suryasa, W. (2018). Education and training improve quality of life and decrease depression score in elderly population. *Eurasian Journal of Analytical Chemistry*, 13(2), 371-377.
18. Nyandra, M., Suryasa, W. (2018). Holistic approach to help sexual dysfunction. *Eurasian Journal of Analytical Chemistry*, 13(3), pp. 207–212.