# Incidence Rate and Risk Factors of Ectopic Pregnancy at Maternity Wards in Baghdad City's Hospitals for the Year 2019

**Heba Samir Naje[1], Hala Saadi Abdul Wahid [2], Ekhlas Ali Hussein[3]**

*[1]MSC, Ministry of Health student at Maternal and Neonate nursing University of Baghdad, [2]Professors, Community Health Nursing College of Nursing, University of Baghdad, [3]Assistant professor,Department of Obstetrics and Gynecology, College of Medicine, Al-Iraqia University*

## Abstract

**Background**: Ectopic pregnancy is a condition of immense gynecological importance, particularly in the developing world, because of the high morbidity and mortality associated with it and the enormous threat to life.

**Objectives:**To assess the incidence rate and the risk factors of ectopic pregnancy at Maternity Wards in Baghdad City's Hospitals for the year 2019.

**Methods:**The study included a non-probability (convenient) sample consisted of (90)pregnant woman who have ectopic pregnancies. The study subjects are recruited from 10 teachinghospitals in Baghdad**,**in theirfirst trimester of gestation age. The studydata is collected from pregnant women' edical records in the Department of Statistics, data are analyzed *using* descriptive and inferential data analysis process.

**Results:** the results of the current study indicate that the incidence rate of ectopic pregnancy is (2.217)per 1000 of population at risk for the year 2019. Smoking is accounted as the most predominant risk factor for ectopic pregnancy (55.6%),Most of these pregnant women are between the ages of (15-24) years old (40.0%), college graduates (26.7%), government employees (52.2%), and have a monthly income (901.000-1.200.000) ID (32.2%).

**Conclusion:**: Incidence rate of ectopic pregnancy at the maternity wards in Baghdad City's hospitals is (2.217) per 1000 of population at risk for the year of 2019, The incidence rate of ectopic pregnancy has not been affected by the risk factors of infertility, previous ectopic pregnancies, IUCD, assisted reproductive techniques and smoking of ectopic pregnancy and the incidence rate of ectopic pregnancy has not been affected by pregnant demographic characteristics of age, education, occupation and monthly income.

***Keywords:*** *Incidence Rate,Ectopic pregnancy, Risk factors.*

## Introduction

An ectopic pregnancy occurs when a fertilized egg grows outside the uterus [1].Ectopic pregnancy is a life threatening emergency, and if not treated, it can produce adverse effect.It remains the leading cause of pregnancy related death during the first trimester, where it is responsible for 9 – 10 % of all maternal deaths[2].The incidence of EP has doubled or trebled over the last 20 years and has become a major public health problem. EP accounts for approximately 2% of reported pregnancy. Approximately 1/100 pregnancies are ectopic, with the concepts usually implanting in the fallopian tube. Some ectopic pregnancies resolve spontaneously, but others continue to grow and lead to rupture of the tube [3].Reported important etiological factors for EP are pelvic inflammatory disease (PID), post-aborted sepsis, puerperal sepsis, previous EP, previous pelvic surgery and the uses of contraceptive device.

Presence of history of infertility and congenital defects of fallopian tubes consider also as other risk

factors.The present study aims to estimate the incidence of ectopic pregnancy among Iraqi women in Baghdad City as it is one of the Ministry of Health research plans priorities, in order to provide data that can assist in the health strategies planning of control.

## Methodology

A descriptive h analytic element design was conducted throughout the present study among pregnant women at Maternity department atten hospitals in Baghdad City. , Department of Statistics (Medical records), in ten hospitals at Baghdad city. Determined validity through panel of experts and reliability of questionnaire(Alpha Correlation Coefficient)is(0.83) which considered significant through of pilot study. they are measured as (2) for Yes and (1) for no .

## Results and Discussion

**Table (1): Pregnant Demographic Characteristics**

| Demographic Characteristics | Frequency | Percent |
|---|---|---|
| 1. Age (Years) | | |
| 15 - 24 | 36 | 40.0 |
| 25 - 34 | 34 | 37.8 |
| 35 - 44 | 17 | 18.9 |
| 45 - 54 | 3 | 3.3 |
| Total | 90 | 100.0 |
| 2. Education | | |
| Illiterate | 2 | 2.2 |
| Able to Read and Write | 2 | 2.2 |
| Primary school Graduate | 12 | 13.3 |
| Intermediate School Graduate | 17 | 18.9 |
| Secondary School Graduate | 12 | 13.3 |
| Institute (Diploma) Graduate | 17 | 18.9 |
| College Graduate | 24 | 26.7 |
| Post Graduate | 4 | 4.4 |
| Total | 90 | 100.0 |
| 3. Occupation | | |
| Government Employee | 47 | 52.2 |
| Self- Employed | 17 | 18.9 |
| Unemployed | 26 | 28.9 |
| Total | 90 | 100.0 |
| 4. Monthly Income | | |
| 300.000 - 600.000 ID | 23 | 25.6 |
| 601.000 - 900.000 ID | 17 | 18.9 |
| 901.000 - 1.200.000 ID | 29 | 32.2 |
| 1.201.001- 1.500.000 ID | 21 | 23.3 |
| Total | 90 | 100.0 |

Results, out of this table, depicts that most of these pregnant are (15-24) year old (40.0%), college graduates (26.7%), government employee (52.2%) and making monthly income of (901.000-1.200.000) ID (32.2%).

$$\text{Incidence Rate} = \frac{\text{New Cases}}{\text{Total Populaion}} \times 1000$$

$$= \frac{90}{40.580} \times 1000$$

$$= 2.217$$

**Figure (1): Incidence Rate of Ectopic Pregnancy in Baghdad City during 2019.**

**Table (2): Risk Factors for Ectopic Pregnancy**

| Lists | Risk Factors | Yes | | NO | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent |
| 1 | Infertility | 39 | 43.3 | 51 | 56.7 |
| 2 | Previous ectopic pregnancies | 12 | 13.3 | 78 | 86.7 |
| 3 | IUCD | 24 | 26.7 | 66 | 73.3 |
| 4 | Assisted Reproductive Techniques | 24 | 26.7 | 66 | 73.3 |
| 5 | Smoking | 50 | 55.6 | 40 | 44.4 |

Results, out of this table, show that smoking is accounted as the most risk factor for ectopic pregnancy (55.6%) in these women.

**Table (3): The Relationship between Incidence Rate of Ectopic Pregnancy and Risk Factors of Ectopic Pregnancy**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t-test | P.Value |
|---|---|---|---|---|---|---|
| | | B | Standard Error | Beta | | |
| | (Constant) | 22.178 | 0.000 | | 124976.342 | 0.000 |
| | Risk Factors | -2.083E-5 | 0.000 | -0.084 | -0.789 | 0.432 |
| a. Dependent Variable: Incidence Rate | | | | | | |

Result, out of this table, indicates that there is no significant relationship between incidence rate of ectopic pregnancy and risk factors of ectopic pregnancy.

## Discussion of the Study Results

Part I: Discussion of Pregnant Socio-demographic Characteristics

Analysis of such characteristics has depicted that these pregnant women are mostly teenagers (15-24) year old and they are accounted for (40.0%) of the total sample (Table 4-1). This finding presents an evidence that such pregnant in this age can develops ectopic pregnancy than others and they are presenting the nature of pregnant women in our culture of getting marriage at earlier age.

The current study finding agrees with a hospital based unmatched case control study results, of (99) cases with ectopic pregnancy and (200) controls who have been selected with a simple random sampling method, the study has identified that the average (± SD) of pregnant age is 27 (± 5) years [4].

Information about maternal demographic characteristics is obtained from the Pregnancy Risk Assessment Monitoring System by (CDC, 2009) has agreed with the study finding and presented evidence that the age distribution of respondents is as follows: (10.5%) are (19) years of age and younger, (76.2%) are (20–34) years of age, and (13.3%) are (35) years old and older.

With respect to their education, the study findings indicate that most of these pregnant are well educated as being college graduates (26.7%) (Table1). This can be interpreted in a way that women in our society are fortunate to continue and pursue well education in the recent years.

Such result does not agree with a report has indicated that more than half (53.4%) of pregnant women reported having more than a high school education, followed by (27.9%) with at least a high school education and (18.7%) with less than a high school education [5].

The current study finding is agreed with that of a cross-sectional study, of (300) pregnant woman with ectopic pregnancy who are with only primary/Junior High School education ($p=0.048$) [6].

With regard to their employment, the study has revealed that more than half of the study sample are government employee (52.2%) and making monthly income of (901.000-1.200.000) Iraqi Dinar (32.2%) (Table1). Such findings can be inferred that these pregnant play the role as breadwinners for their families.

In the contrary with a retrospective studyin Urban Nigeria, on (72) case of ectopic pregnancy, shows that the health problem of ectopic pregnancy is exacerbated with social issues leading to financial stress due to palpable poverty[7].

Part II: Discussion of the Incidence Rate of Ectopic Pregnancy

The present study reveals that the incidence rate of ectopic pregnancy is 2.217 per 1000 of population at risk for the year of 2019 in Baghdad City (Figure 1). It is worth to mention that there are other cases of ectopic pregnancy (about 50 cases) which was documented, but the researcher couldn't reach their files due to the uncooperative administration of the hospitals under the study.

This finding is higher than a finding of retrospective study, six thousand six hundred sixty-two women give birth in the hospital, (88) women are diagnosed with ectopic pregnancy with an incidence of 1.3% [8].

It has been found in the literature that ectopic pregnancy is a potentially life-threatening condition occurring in (1-2 %) of all pregnancies. The most common ectopic implantation site is the fallopian tube, though 10 % of ectopic pregnancies implant in the cervix, ovary, and myometrium, interstitial portion of the fallopian tube, abdominal cavity or within a cesarean section scar [9].

It has been noted that the incidence rate is (0.5%-1.5%) of all pregnancies. Even though its incidence rate is drop off when compared with earlier decades, it is still the foremost causes of maternal morbidity and mortality in the first trimester of pregnancy, especially in developing countries. In Pakistan, it varies from 1:1 124 to 1:130 pregnancies [10].

Furthermore, the current study is more far lower than a worldwide view presents that incidence rate is (12.4/ 1000) reported pregnancy in England-Wales, (0.52/ 1000) women of reproductive age in Beijing-China, (1.68/ 100) total births in Nigeria and (4%) in

Ghana [11].

Part III: Discussion of Risk Factors for Ectopic Pregnancy

Analysis of risk factors results for ectopic pregnancy reveals that smoking is accounted as the most risk factor for ectopic pregnancy (55.6%) and then comes the risk factor of infertility (43.3%), and the least risk factors are IUCD (26.7%) and assisted reproductive techniques (26.7%) and previous ectopic pregnancies (13.3%) (Table 4-7).The findings of the study have presented evidence about these factors as being considered as risk factors for ectopic pregnancy among the study sample.

Such findings agrees with a matched case-control study, of (88) cases and (176) controls, has explored that of the fifteen identified risk factors, four are independently associated with increased odds of ectopic pregnancy: prior pelvic inflammatory disease (PID) (adjusted odds ratio [AOR] 13.18; 95% CI 6.19–27.42), followed by current use of levonorgestrel-only pills for emergency contraception (LNG-EC) (AOR 10.15; 95% CI 2.21–46.56), previous use of depot medroxy progesterone acetate (DMPA) (AOR 3.01; 95% CI 1.04–8.69) and smoking at the time of conception (AOR 2.68; 95% CI 1.12–6.40) [12].

A case-control study, of women who are diagnosed with ectopic pregnancy ($n$=2411) and women with intrauterine pregnancies ($n$=2416) are recruited from five hospitals in Shanghai, China reveals that the risk of ectopic pregnancy is associated with the traditional risk factors including previous EP (Adjusted odds ratio [AOR]=2.72, 95 % CI: 1.83–4.05), previous Chlamydia trachomatis infection (Adjusted OR=3.18, 95 % CI: 2.64, 3.84), previous infertility (AOR=2.18, 95 % CI: 1.66–2.88), previous adnexal surgery (AOR=2.09, 95 % CI: 1.49–2.93), previous appendectomy (AOR=1.64, 95 % CI: 1.13–2.37), and previous use of intrauterine devices (IUDs) (AOR=1.72, 95 % CI: 1.39–2.13). Additionally, EP risk is increased following the failure of most contraceptives used in the current cycle including IUDs (AOR=16.43, 95 % CI: 10.42–25.89), oral contraceptive pills (AOR=3.02, 95 % CI: 1.16–7.86), levonorgestrel emergency contraception (AOR=4.75, 95 % CI: 3.79–5.96), and female sterilization (AOR = 4 .73, 95 % CI: 1.04–21.52). Stratified analysis shows that *in vitro* fertilization and embryo transfer (IVF-ET) is the main risk factor for EP in women with tubal infertility (AOR=8.99, 95 % CI: 1.98–40.84), although IVF-ET shows no association with EP in women with non-tubal infertility (AOR=2.52, 95 % CI: 0.14–44.67) [13].

In a mini-review study, it has been reported that risk factors associated to ectopic pregnancy are pelvic inflammatory disease, past history of miscarriages, age, parity, infertility, previous ectopic pregnancy, induction of ovulation and intrauterine device usage [10].

A cross-sectional study, of (900) pregnant woman diagnosed with ectopic pregnancy, has depicted that the risk of EP is associated with previous adnexal surgery (adjusted OR = 3.99, 95% CI: 2.40–6.63), uncertainty of previous pelvic inflammatory disease (adjusted OR = 6.89, 95% CI: 3.29–14.41), and positive CT IgG serology (adjusted OR = 5.26, 95% CI: 3.94–7.04). A history of infertility including tubalinfertility (adjusted OR = 3.62, 95% CI: 1.52–8.63), non-tubal infertility (adjusted OR = 3.34, 95% CI: 1.60–6.93), and in vitro fertilization (IVF) treatment (adjusted OR = 5.96, 95% CI: 1.68–21.21) are correlated with the risk of ectopic pregnancy [14].

A case-control study, of (150) cases and (300) controls, has found that the risk of ectopic pregnancy has increased with the use of intrauterine device and tubal ligation, whereas decreased with use of oral contraception [15].

A five year retrospective study, of (72) case of ectopic pregnancy, reveals that related risk factors include pelvic inflammatory disease, previous history of abortions, infertility and a previous history of ectopic pregnancy [7].

A hospital based unmatched case control study, of (99) cases with ectopic pregnancy and (200) controls have been selected with simple random sampling method, has indicated that the risk factors identified are marital status and history of contraception use. Accordingly, women with single marital status are (10.81) times (95% CI AOR (3.601, 32.465) more likely to develop ectopic pregnancy than married once. Those who use contraception are (2.27) times (95% CI, AOR (0.214, 24.02) more likely to develop ectopic pregnancy than who do not use contraception (Kebede and Dessiein 2018)[4] .This study is not compatible with current study.

**Part V:Discussion of the Relationship between Incidence Rate of Ectopic Pregnancy andRisk Factors of Ectopic Pregnancy**

The study findings indicate that the incidence rate of ectopic pregnancy has not been affected by the risk factors of infertility, previous ectopic pregnancies, IUCD, assisted reproductive techniques and smoking of ectopic pregnancy (Table 4-10).

Contrary findings have been reported in the literature that risk factors of surgical, gynecological, obstetrics, sexual, contraceptive, and infectious histories; demographic characteristics; smoking habits; and fertility markers are initiated to be associated with the incidence of ectopicpregnancy[16].

## Conclusion

Incidence rate of ectopic pregnancy at the maternity wards in Baghdad City's hospitals is (2.217) per 1000 of population at risk for the year of 2019,The incidence rate of ectopic pregnancy has not been affected by the risk factors of infertility, previous ectopic pregnancies, IUCD, assisted reproductive techniques and smoking of ectopic pregnancy and the incidence rate of ectopic pregnancy has not been affected by pregnant demographic characteristics of age, education, occupation and monthly income.

**Recommendations:**

Measures for early diagnosis of ectopic pregnancy,Annual measurements for the incidence of ectopic pregnancy and accurate follow up for registration and documentation of the cases.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

## References

1. CROCHET, John R, BASTIAN Lori A, CHIREAU Monique V. Does this woman have an ectopic pregnancy?: the rational clinical examination systematic review. Jama, 2013, 309.16: 1722-1729.
2. Nordström F, McTaggart J, Melander E, Altman D & Kopp Kallner H. Contraceptive use at the time of and after an ectopic pregnancy: a retrospective cohort study. EJCRHC, (2020). 25(2), 147-150.
3. Lin S, Yang R, Chi H, Lian Y, Wang J, Huang S, ... &Qiao J. Increased incidence of ectopic pregnancy after in vitro fertilization in women with decreased ovarian reserve. Oncotarget, (2017). 8(9), 14570.
4. Kebede Y and Dessie G. Determinants of Ectopic Pregnancy among Pregnant Women who were Managed in Nekemte Referral Hospital, Oromia Region, Ethiopia. J PCH, (2018). 5(2), pp. 370-377.
5. Center for Disease Control and Prevention (CDC). Pregnancy Risk Assessment MonitoringSystem,(2009).
6. Mohammed S, Yakubu I and Awal I. Socio-demographic Factors Associated with Women's Perspectives on Male Involvement in Antenatal Care,LCJP (2020).. Available at: https://www.hindawi.com/journals/jp/2020/6421617/#abstract
7. Tom E, Okpara A, Imo P, John E, Kayode O,Nyong A. and Enobong, I. Ectopic Pregnancy: A Nigerian Urban Experience. KJOG, (2012). 55(5), pp. 309-314.
8. Mooij R,Mgalega G,Mwampagatwa I,Dillen J and Stekelenburg J. A cohort of Women with Ectopic Pregnancy: Challenges in Diagnosis and Management in a Rural Hospital in a Low-income Country. BMC Pregnancy and Childbirth, (2018). 18(159).
9. PANELLI Danielle M, PHILLIPS Catherine H, BRADYPaula C. Incidence, diagnosis and management of tubal and nontubal ectopic pregnancies: a review. FRPF, 2015, 1.1: 15.
10. Sultana S, Asif H. and Akhtar N. Incidence Rate and Prevalence of Major Risk Factors for Ectopic Pregnancy in the Pakistani Population: Mini-review. APJTD ,(2015). 5(3), pp. 246-250.
11. Buyukbayrak E. Incidence of Ectopic Pregnancy. World Health Organization, Geneva. (2004).
12. Mindjah Y,Essiben F and Mboudou E. Risk Factors for Ectopic Pregnancy in a Population of Cameroonian Women: A case-control Study. PLoS One, (2018). 13(12), pp. 1-23.
13. Li C, Meng C, Zhao W, Zhu Q, CaoS, Ping H, Xi X, Qin G, Yan M, Zhang D,Qiu J and Zhang

J. Risk Factors for Ectopic Pregnancy: A multi-center Case-control Study. BMC Pregnancy and Childbirth, (2015). 15, pp. 187-195.

14. Li C, Meng C, Zhao W and Zhang J. Risk Factors for Ectopic Pregnancy in Women with Planned Pregnancy: A case-control Study.EJOGRB, (2014). 181.
15. Parashi S,Moukhah S and Ashrafi M. Main Risk Factors for Ectopic Pregnancy: A Case-Control Study in A Sample of Iranian Women. IJFS, (2014). 8(2), pp. 147-154.
16. Moini A, Hosseini R and Akhoond M. Risk Factors for Ectopic Pregnancy: A case–control Study. JRMS, (2014). 19(9), pp. 844-849