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# A Case Control Study of Associated Factors with Abortion in Mosul City

**Ruqaya Adnan Salih[1]; Omaya Fakhri Qassid [2]**

**[1] Mosul University; [2]Alquds Family Medicine Center**

*ABSTRACT*

**Background:** a common undesirable outcome of pregnancy is abortion, mainly in the first trimester, and cause  complication both physical and psychological.

**Aim:** To assess the associated factors with abortion in Mosul city.

**Patients and Method:**A case-control study done at Mosul teaching hospitals for Obstetrics and Gyneacology (Al-Batool teaching hospital and Al-Khnsaa teaching hospital) .

The study took 6 months period  from 1st of February 2016 to 30th of July 2016.

A total of 300 pregnant women were collected -150 cases (documented to be pregnant by pregnancy test or by ultrasound) and 150 controls.

**Results:** A significant association has been found for the age of women <15 years and ≥ 40 years with abortion with p. value 0.01 & 0.05 respectivly.

A highly significant association was found in nullipara women (P=0.001) . History of  more than two abortion and a short inter-pregnancy interval (less than 6 months) all show a significant association with abortion (P. value of 0.002, 0.001 & 0.000  respectively .

Hypertension, Diabetes and history of fever are all found having a significant relation with abortion with p. value of 0.025, 0.05 and 0.002 respectively.

A highly significant relation has been found between history of congenital abnormalities and abortion (p=0.000) also cervical incompetence and fibroid show a significant association with abortion with p. value of 0.004 and 0.002 respectively.

 Absent Antenatal care show highly significant association with abortion(p.value0.000).Consanguinity appeared to have a significant association with abortion with P. value of 0.001.

**Conclusions:** consangeous marriage have risk of abortion and congenital abnormalities. Pregnancy at both extreme of age (less than 15 years and 40 years and more) has a more chance of abortion.

*Corresponding author E mail :* rruqayya@yahoo.com

**Introduction:**

One of the most spread medical problems in reproductive couples is abortion(loss of pregnancy), with as many as 25% of all women getting pregnancy having at least one spontaneous abortion. It is unfavourable event for most individuals, and physicians are usually called on to provide insight and counseling[1,2,3].

Abortion is a common spontaneous or induced lossing of an early pregnancy(20 weeks gestation or when the fetus about 500 grams) [1,4].

Threatened abortion is usually common; about 25-30% of all pregnancies have little bleeding through pregnancy[5].

In the first trimester, embryonic causes of spontaneous abortion are the main cause and contribute for 80-90% of abortions [6]. The causes of cervical incompetence are either iatrogenic (from vigorous D&C, cervical conization, laceration of the cervix), or congenital[1,7,8].

The main risk factors of abortion are[2,9,10] : increased maternal age,over weight ,number of previous abortion, medical conditions, anatomical anomali of the reproductive system.

The aim of the present studyis to assess associated factors with abortion in women attending maternity hospitals in Mosul city .

Specific objectives:

1. To determine the association between maternal age, parity, gravidity with abortion

2.To assess the presence of association between outcome of previous pregnancy and current pregnancy

3.To suggest some methods for controlling of certain associated factors of abortion if possible.

**Patients and Methods:**

*Administrative agreement &ethical approval*

Official permission to perform the study has been obtained from the General Directorate of Health in Nenavah Governarate.A verbal

patient consent to participate in research has been obtained from each patient.

## Study Setting

The study was done in Mosul teaching hospitals for obstetrics and gynecology Al-Batool and Al-Khansaa teaching hospitals.

## Study Period

The study took 6 months period starting from 1st of February 2016 to 30th of July 2017.

## Study sample

To reach the aim of the present study 150 pregnant women who just loss or may loss their fetuses prior to or at 20 weeks of gestation were considered as cases,and 150 pregnant women who just delivered a live full term baby were considered as controls .

Pregnant women having ectopic pregnancy, hydatiform pregnancy , and twin pregnancy were not included in the study.

## Study design

case-control study design

## Data collection tool

For data collection aquestionnaire form was used which constitute:

Demographic information : age, residence,.Educational state (illiterate, primary school, secondary school, higher education) occupation,.Consanguinity,History of present pregnancy in regard to history of bleeding, cervical incompetence, or high fever.Medical history hypertension, diabetes mellites ,SLE , TORCH infection,Past obstetric history: parity, gravidity, number of previous abortion, outcome of preceding pregnancy, history of congenital or acquired uterine anomaly..Family history of congenital abnormalities. Antenatal care visits and frequency of visits,certain laboratory and ultrasound results.

## Statistical analysis

After collection of data, tabulation and analysis of data by using laptop computer and excel program &statistically analyzed by $x^2$test for testing of significant association( between associated factor and abortion) .

**Results:**

**Table (1) Demographic distribution of the study population**.

| parameters | | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | | | | |
| age | <15 | 10 | 6.7% | 2 | 0.13% | 6.515 | **0.01** | **5.29** | 1.46-19.01 |
| | 40+ | 11 | 7.3% | 3 | 2% | 3.84 | **0.05** | **3.88** | 0.99-15.05 |
| Residency | urban | 95 | 63.3% | 78 | 52% | 3.495 | 0.06 | 1.59 | 0.80-2.58 |
| | Rural | 55 | 36.7% | 72 | 48% | | | | |
| Occupation | Employed | 15 | 10% | 6 | 4% | 3.277 | 0.07 | 2.67 | 0.92-7.72 |
| | Housewife | 135 | 90% | 144 | 96% | | | | |
| Consanguinity | Present | 92 | 61.3% | 61 | 40.7% | 12.00 | **0.001** | **2.314** | 1.43-3.71 |
| | Absent | 58 | 38.7% | 89 | 59.3% | | | | |

This table shows a high significant association between consanguinity and abortion (p=0.001) and a significant association at both extreme of age (<15 years and 40 years and more) with abortion (p=0.01 and 0.05) respectively.

**Table (2) Distribution of study population according to parity**

| Parity | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| **0** | 34 | 22.6% | 13 | 8.6% | 10.1 | **0.001** | **3.08** | 1.53-6.15 |
| 1 | 24 | 16% | 29 | 19.3% | 0.366 | 0.61 | 0.79 | 0.36-1.69 |
| 2 | 16 | 10.6% | 24 | 16% | 1.413 | 0.25 | 0.63 | 0.29-1.34 |
| 3 | 29 | 19.3% | 34 | 22.6% | 0.321 | 0.57 | 0.81 | 0.39-1.68 |
| 4 | 16 | 10.6% | 24 | 16% | 1.431 | 0.25 | 0.63 | 0.29-2.12 |
| 5+ | 31 | 20.6% | 26 | 17.3% | 0.43 | 0.59 | 1.24 | 0.65-2.36 |

This table shows a high significant association in those nullipara women with abortion (p=0.001).

**Table (3) Distribution of the study population according to numbers of previous abortion.**

| No. of previous abortion | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| **0** | 34 | 22.7% | 82 | 54.7% | 31.04 | **0.000** | **0.24** | 0.14-0.39 |
| **1** | 56 | 37.3% | 35 | 23.3% | 6.30 | **0.011** | **1.95** | 1.15-3.29 |
| **2+** | 60 | 40% | 33 | 22% | 10.53 | **0.001** | **2.36** | 1.40-3.95 |

This table demonestrated that history of previous abortion has a significant association with abortion and risk being increase with increasing numbers of previous abortions (p=0.011, OR=1.95) for those with history of one abortion and for those having two and more previous abortion (p=0.001, OR=2.36), while those with no history of abortion have less abortion frequency(p=0.000, OR=0.24).

**Table (4) Distribution of the study population according to inter-pregnancy intervals between preceding pregnancy and current pregnancy**

| intervals | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| Gravid 1 | 34 | 22.7% | 18 | 12% | 5.234 | 0.025 | 2.15 | 1.11-4.14 |
| <6 months | 86 | 57.3% | 42 | 28% | 25.2 | **0.000** | **3.45** | 2.12-5.59 |
| >6 months | 30 | 20% | 90 | 60% | 48.35 | **0.000** | **0.17** | 0.12-0.24 |

This table shows a very highly significant association between short inter-pregnancy intervals between preceding pregnancy and current pregnancy (<6 months) and abortion (p=0.000), while those with more than 6 months intervals associated with low abortion occurance.

**Table (5) Distribution of study population according to medical history**

| Medical history | | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | | | | |
| HT | Present | 34 | 22.7% | 16 | 10.7% | 5.234 | **0.025** | **2.15** | 1.11-4.14 |
| | Absent | 116 | 77.3% | 134 | 89.3% | | | | |
| DM | Present | 11 | 7.3% | 3 | 2% | 3.84 | **0.05** | **3.88** | 0.99-15.16 |
| | Absent | 139 | 92.7% | 147 | 98 % | | | | |
| TORCH | Present | 5 | 3.3% | 1 | 0.7% | 1.53 | 0.152 | 5.13 | 0.38-69.40 |
| | Absent | 145 | 96.7% | 149 | 99.3% | | | | |

This table reveals that past medical history of HT or DM has a significant association with abortion (p=0.025 and 0.05) respectively. While history of TORCH shows no significant association with abortion (p=0.152).

**Table (6) Distribution of study population according to presence or absence of congenital abnormalities of fetus**

| History of congenital abnormalities | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| Present | 25 | 16.7% | 5 | 3.3% | 13.37 | **0.000** | **5.8** | 2.24-14.72 |
| Absent | 125 | 83.3% | 145 | 96.7% | | | | |

This table shows a very high significant association between history of congenital abnormalities and abortion (p=0.000).

**Table (7) Distribution of the study population according to presence of uterine abnormalities**

| Uterine abnormalities | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| Congenital | 3 | 2% | 1 | 0.7% | 0.25 | 0.69 | 3.04 | 0.04-237.54 |
| **Cervical incompetence** | 23 | 15.3% | 7 | 46% | 8.33 | **0.004** | **3.70** | 1.50-9.00 |
| **Fibroid** | 17 | 11.3% | 3 | 2% | 9.05 | **0.002** | **6.26** | 1.86-20.73 |
| **No uterine abnormalities** | 107 | 71.4% | 139 | 92.6% | 21.7 | **0.000** | **0.19** | 0.09-0.38 |

This table reveals very high significant association between history of cervical incompetence and abortion (p=0.004), also those with history of fibroid has a very significant association with abortion (p=0.002), while those with no uterine abnormalities have a very high significant protection from abortion (p=0.000). History of congenital uterine abnormalities shows no significant association with abortion (p=0.69).

**Table (8) Distribution of study population according to frequency of ANC visits**

| ANC visits | Cases (n=150) | | Controls (n=150) | | $X^2$ | P. value | OR | 95% C.I |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | | |
| 0 | 62 | 41.3% | 30 | 20% | 15.06 | **0.000** | **2.82** | 1.67-4.76 |
| **1-4** | 53 | 35.4% | 69 | 46% | 3.10 | **0.05** | **0.64** | 0.39-1.05 |
| >4 | 35 | 23.3% | 51 | 34% | 3.61 | 0.07 | 0.60 | 0.35-1.01 |

This table shows a very high significant association between absent ANC visits and abortion (p=0.000) while those with 1-4 ANC visits have a significant protection from abortion with OR< 1 (p=0.05, OR=0.64). Those with more than four ANC visits reveals no significant association with abortion (p=0.07).

**Discussion:**

Abortion is the most undesirable evet of pregnancy and it is showed that only 30% of fertilized ovum result in a viable pregnancy and only 50–60% of all gestations advance to ≥ 20 weeks[11].

The current study demonstrated a high significant association between two extremes of reproductive age and abortion, with increase in risk (p=0.01) for those women lesser than 15 years old. Such result goes with the findings of other study conducted in Saudi Arabia during 2000[12]. The study showed that the sample was mainly from urban because women from rural area may aborted at home without consulting doctor, however residency of women showed no significant relation ,this result consistent with result of a study testing the risk of abortion among Tibetans women in rural area in 2014 [13].

A very high significant association has been found between consanguinity and abortion(P value 0.001) this result similar to result obtained by Foren et al[14], this may

be due to increase the risk of homozygosity .

An increase in probability of abortion in nullipara women if compared with those para 1, 2, 3 and 4 has been found with a highly significant association (p=0.001). This result is in agreement with findings of Nielsen et al study[15] and Poorolajal J et al study during 2014 in Iran [16].

Regarding to the number of previous abortion, the study showed a significant association between history of previous two or more abortion and abortion in present pregnancy (p=0.001) this agree with previous study that demonstrate an increase risk of abortion directly when increasing number of previous losses[17]. Also a significant relation found between short inter-pregnancy interval and abortion, (OR=3.45, p=0.000), on opposite view an interval of more than 6 months consider as a protection from abortion(OR=0.17, p=0.000) this goes with result of study of Shah R et al in Bangladesh in 2014[18].

For the medical history in pregnancy, a significant association has been found between history of hypertension and abortion (p=0.025), this consistent with findings of a study conducted in Panama by Gracia et al in 2004[19].The reason for this could be through certain undesirable event of hypertention such as Intrauterine Growth Retardation IUGR and Ante-Partum Hemorrhage [1, 20].

Diabetes has significant association with abortion (p=0.005), a nearly similar result has been found by several other studies[21].This increased risk can be due to chronic intrauterine hypoxia from decreased uteroplacental blood flow in poor diabetic control women[21,22] .Fever during pregnancy had a significant association with abortion (p=0.002) ,this in agreement with the result obtained by Delabaere A et al in 2014 in Paris, France [20].

0n the other hand, another study of TORCH infection show no significant association with abortion P=0.152 this result is opposite to

outcome of study done in China[23]. This discrebancy may be due to that TORCH epidemiology depend on geographic area and immunization, and as the( current)study cases was mainly from urban area where they are health educated to Toxoplasmosis [1,14].

Having history of congenital abnormalities in off spring show high significant association with abortion p= 0.000, this is similar to result of other studies, such association is due to the truecy that these congenital abnormalities may have a chromosomal abnormalities which in turn lead to abortion[24]. Also a significant relation found between uterine abnormalities like cervical incompetence and uterine fibroid with abortion with p. value of 0.004 & 0.002 respectively. This result has been demonstrated also by other study done in Hungarian[7]. This may be clear by that cervical incompetence allow fast passage of product of conception, also fibroid may expressed a pressure effect on uterus and some time treated by

hormones which can affect the pregnancy[1] .

Other important result obtained is the Ante-Natal Care ANC visit and its effect on pregnancy outcome, as the study revealed a significant protection from abortion in women with frequent(1-4 ANC visits), while those with no ANC visit has a highly significant association with abortion P=0.000, this result is in consistant with result of many other studies [18]. This may be due to that ANC visit has a( critical role) in early diagnosis and proper management of high risk-pregnancy [1,9,25].

 **Conclusions:**

A significant( association) founded between consanguinity and abortion, both extreme of age, being nuli-para or grand multi-para, and a history of previous 2 or more abortion all had significant association with abortion. Inter-pregnancy interval between preceding pregnancy and current pregnancy of less than 6 months demonstrate increased probability of abortion, even cervical incompetence

and fibroid both have a significant association with abortion. ANC visits not associated with abortion.

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**Questionnaire form:**

*Risk factors of abortion in Mosul city*

1. Pts name:

2. Age:

3. Residence: urban      rural

4. Occupation: employed      housewife

5. Education: illiterate, primary school

higher school, university.

6. Consanguinity: yes        no

7. Parity:        gravidity:        abortion:

8. LMP:        EDD:        gestational age:

9.  History of  bleeding in this pregnancy: yes   no

10. History of  fever during pregnancy:  yes    no

11. Interval between last pregnancy & current pregnancy:

12. Outcome of immediately preceding pregnancy: success    loss

13. Medical history:

HT:

    DM :

    SLE:

Thyroid disease:

PCO:

14. History of  TORCH infection:     yes           no


15. History of  trauma:            yes          no


16. History of  drug intake:          yes          no

    Anti-hypertensive drug

    Anti-epiliptic drug

    NSAID

17. History of antiphospholipid antibody syndrome:    yes    no

18. ANC visits: yes        no

Frequency of ANC visit:

19. Family history of congenital abnormalities:         yes       no

20. History of congenital  uterine anomalies: yes    no Type of anomaly:

21. History of  acquired uterine anomalies:              yes       no

Type of anomaly:

Adhesion-synechiae,

Leiomyoma

Endometriosis

Fibroid

Cervical incompetence

22. Laboratory  finding:

Blood group &Rh.:

Hemoglobin level:

Random blood sugar:

23. Ultrasound  results: