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Original Research Article

A STUDY ON RISK FACTORS AND MANAGEMENT OF EARLY PREGANANCY LOSS IN TERTIARY CARE MATERNITY HOSPITAL

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ABSTRACT

Background: To study the risk factors and management of early pregnancy loss in tertiary care maternity hospital.

Materials and Methods: It is a hospital based observational study in tertiary maternity hospital for a period of 2 years in pregnant woman with early pregnancy loss before 12 weeks 6 days of gestational age, both primary and secondary and Singleton pregnancy.

Results: The age at which most early pregnancy losses occurred was between 31-35 years followed by >36 years. The occurrence of early pregnancy loss was observed to be more in educated subjects when compared to illiterate subjects. Early pregnancy loss more common in women who were unemployed when compared to employed women. The present study showed that rate of early loss of pregnancy was maximum in those women who were conceiving for the first time compared to women who have conceived before. Majority of the early pregnancy losses occurred in the gestational age of 6 – 9 weeks compared to the other gestational ages in weeks. The major type of abortion that was diagnosed among the subjects was complete abortion followed by incomplete abortion, missed abortion and septic abortion. The majority of subjects were given MVA followed by medical management, D&C and expectant management. Complications followed by management were looked into and it was observed that majority of the subjects had anaemia followed by hypovolemic shock, haemorrhagic shock and septicaemia. The body mass index of the subjects was also looked into and it was observed in the present study that majority of the subjects were obese followed by overweight, normal weight and underweight.

Conclusion: Findings of the current study shown that risk factors of miscarriages included age of mother, increased BMI and previous history of miscarriages. All these factors need to be considered while providing antenatal care to mothers to mitigate the risk of miscarriages.

Keywords: Pregnancy Loss, Risk Factors, Miscarriages, Antenatal Care.

INTRODUCTION

Loss of pregnancy prior to 13 weeks of gestation, including non-induced embryonic death or passage of products of conception occurs spontaneously in 25 – 50% of pregnancies. It has been established that most early losses of pregnancies occur in the first trimester, before 12th weeks of conception and pregnancy loss in the second trimester account to about 1-5%. About 50% of early pregnancy losses occur due to abnormal foetal chromosomes, called aneuploidy. Chromosomal problems may result in a

blighted ovum (when embryo doesn't form), intrauterine foetal demise (when embryo stops to develop and dies), molar pregnancy (when the foetus fails to develop and there is an abnormality of the placenta) or partial molar pregnancy (when there is abnormality in the development of both the placenta and the foetus). Certain factors that increase the risk of early pregnancy loss are maternal age of more than 35 years, obesity, two or more consecutive miscarriages in the past, smoking, drinking alcohol, caffein, use of illicit drugs and undergoing invasive prenatal genetic tests. Other causes may include maternal health conditions like uncontrolled diabetes, thyroid diseases, infections, uterus or cervical problems, hormonal problems etc.[1,2]

All pregnancies are risky even though they are uneventful. It is estimated that about 15% of all pregnancies require skilled obstetric care for survival. The experience of having an early loss of pregnancy commonly involves the feelings of shame, stigma and guilt. There can be a profound sense of psychological and social loss associated with a miscarriage and its effects can be long lasting. The severe physical effects of miscarriage and the stress and trauma can affect a new pregnancy. Men also struggle with feelings of inadequacy and they don't know how to help their partner deal with this loss. A common question that the couple may have is to know why there was an early loss of pregnancy.[3]

To cater to these needs, we need a thorough knowledge about the risk factors that are associated with the occurrence of early loss of pregnancy. Women around the world have varying access to healthcare services. This study is being conducted in a tertiary level hospital which allows access to skilled obstetricians and advance services for better patient care and follow up. The method of management will be different for different types of miscarriages and so a study on the methods of management will be helpful to choose the best possible management according to the patient's needs and demands. Risk factors of early loss of pregnancy and its management has not been explored nor published in the country, state and region. There is a scarcity of studies done on early loss of pregnancy in India. No study has been done on the risk factors and management of early loss of pregnancy in Hyderabad district and Telangana state so far.

MATERIAL AND METHODS

Hospital based observational study in tertiary maternity hospital for a period of 2 years. The study will be conducted on pregnant women attending the tertiary care maternity hospital at Government Maternity Hospital, Sultan Bazar, Hyderabad. The risk factors associated with early pregnancy loss will be evaluated by detailed clinical history, investigations and physical examination.

Inclusion Criteria: Any pregnant woman with early pregnancy loss before 12 weeks 6 days of gestational age, both primary and secondary and Singleton pregnancy.

Exclusion Criteria: Ectopic pregnancy, Molar pregnancy and Multiple gestation

The diagnosis will be made by complete physical examination, ultrasound and serological methods. The management will be determined by maternal hemodynamic stability, presence of infection, gestational age, type of miscarriage and parity. All the participants will be treated as per hospital protocol.

Statistical Analysis: Data will be entered in MS Excel and will be analysed using EPI info. Mean, median and frequencies will be used and appropriate tests of significance will be used.

Sample size: The sample size was calculated based on prevalence of early pregnancy loss as 4.93%, according to literature.[4] The sample size was calculated using the formula:

Where: n = sample size,

$n = (Z1-a)2(p \times q)\ l2\ (1.96)2(p \times q)\ l2$

α = confidence interval, taken as 95% confidence interval,

p = prevalence of early loss of pregnancy in India,

q = 100 – p,

l = allowable error, taken as absolute precision of 5%.

By substituting the above data in the equation, the sample size is

$n = (1.96)2(4.93 \times 95.07)\ 52 = 92$

After adding a non-response rate of 10%, an additional 8 subjects were included, bringing the total sample size to 100 subjects.

Data collection

Institutional ethical committee approval and consent from the participants was sought. A pre-designed, semi-structured proforma was used to gather data about various variables under study.

The data for the present study was collected from the tertiary hospital, Government Maternity Hospital, Sultan Bazar, under Osmania Medical College, Hyderabad.

Potential subjects were sought from the hospital attendance to the obstetrics and gynaecology department. Hospital based recruitment of 100 women with pregnancy loss was conducted. The type of sampling employed was convenience sampling. Women with confirmed pregnancy who presented with pregnancy loss were included in the study. Women with confirmed pregnancy but diagnosed with ectopic pregnancy, molar pregnancy and multiple gestation were excluded as per the exclusion criteria of the study.

The subjects were interviewed in their local language – Hindi, Telugu or Urdu by employing the pre-designed, semi-structured questionnaire and appropriate physical and laboratory examinations

were carried out. The subjects were asked for written consent before their recruitment and commencement of the study. The consent form was written in four local languages – English, Hindi, Telugu and Urdu. Additionally, the consent form was read out to the patients to allow them to make an informed decision about giving consent to the various aspects of the study.

Education

Illiterate – A person who could not read or write in any language.

Primary school – Class 1- 5
Middle school – Class 6 – 7
Higher secondary – Class 8 – 10
Intermediate – class 11 – 12
Graduation
Postgraduation

Socio-economic status of the subjects was recorded and classified as per the modified BG Prasad socio-economic scale (2020). The income cut-offs were updated using the All-India Consumer Price Index for industrial workers as per September 2020.

Type of case: was recorded as referred, booked or un-booked case.

Past history: was recoded for chronic diseases like DM, HTN, CAD, TB, epilepsy and thyroid disorder. History of drug allergy and transfusion history was also recorded.

Table 1: shows the types of pregnancy loss

Diagnosis	Characteristics
Complete pregnancy loss	Complete passage of products of conception
	Cervix closed
	Endometrial thickness < 15mm
Incomplete pregnancy loss	Partial passage of products of conception
	Cervix open or closed
	Any endometrial thickness
Delayed pregnancy loss	No tissue passage
	Cervix closed

Body mass index was calculated according to Asian/Indian specific values. Management of early loss of pregnancy is done based on the type of abortion, the patient's hemodynamic stability, weeks of gestation, presence of infection and the patient's preference.[1] Expectant management: is the initial treatment of choice for spontaneous pregnancy loss. Incomplete pregnancy losses also respond well to expectant management. Complete expulsion may take up to 1 month. However, most women ask for other management methods after about 1 week.[1]

Medical management is done by mifepristone, 200 mg, given 24 – 36 hours before one dose of misoprostol, 800 µg, resulted in an overall expulsion success rate of 91% to 96% when given up to 9 weeks of gestation. Surgical management: involves sharp curettage, electric vacuum aspiration [EVA), manual vacuum aspiration (MVA), or a combination of vacuum aspiration and sharp curettage.[5]

Complications at the time of discharge: were graded under no complications, anaemia, hypovolaemic shock and septicaemia

RESULTS

Among the subjects, 7 belonged to the age group of < 20 years, 19 belonged to the age group of 21-25 years, 27 belonged to the age group 26-30 years, 37 belonged to the age group 31-35 years and 10 belonged to the age group of > 36 years. The mean age of the subjects was 28 ± 0.25. Among the study participants who had early loss of pregnancy, 16% were illiterate, 22% had primary school education, 36% had secondary school education, 19% studied intermediate and 7% were graduates. Of the patients who had a miscarriage, 66% were unemployed and 34% were employed and working. We can observe that 22% of the participants belonged to lower class, 30% of the participants belonged to lower-middle class, 28% belonged to middle class, 16% were from upper-middle class and 4% of the participants belonged to upper class. It was observed that 15 % of the participants who had early pregnancy loss were referred cases, i.e. they were sent by other practitioners. 77% were booked cases, i.e. they had regular check-ups at the hospital. 8% were un-booked cases, i.e. they were not previously registered or visited the hospital for regular check-ups. [Table 2]

Among the patients with miscarriage, 36% were primi gravida, 28% were second gravida, 19% were third gravida, 6% were fourth gravida and 11% were fifth gravida. The data shows that among the subjects, 32% had a gestational age of < 6 weeks, 42% had a gestational age of 6 to 9 weeks and 26% had a gestational age of 10 – 13 weeks. It was observed that 48% of the patients with early pregnancy loss had no history of previous abortions. 16% of the subjects had experienced one loss of pregnancy, 22% had history of two abortions in the past and 14% of the study participants had more than 3 abortions. [Table 3]

It was observed that out of the 100 participants, 39% of the participants had no co-morbidities. 24% of the subjects had anaemia, 13% had diabetes, 13% had hypertension, 11% had hypothyroidism, and 7% had a history of surgery performed on the cervix. [Table 4]

18% had no particular chief complaint and came for routine check-up, 5% had nausea/vomiting, 12% had dizziness, 23% had pain in the abdomen and 42% had bleeding PV. [Table 5]

Participants with early pregnancy loss, 44% had complete abortion, 31% had incomplete abortion, 18% had missed abortion and 7% had septic abortion. [Table 6]

It was observed that 71% of the patients did not experience any complications, 20% were anaemic, 5% had bleeding leading to hypovolemic shock and

2% experienced haemorrhagic shock and 2% had septicaemia. [Table 7]

40 percent of the subjects were given medical management, 51 percent underwent MVA, 6 percent had D & C procedure done and 3 percent were under expectant management. [Figure 1]

It is found that 16% of the participants were underweight, 22% were in the normal weight range, 26% were over-weight, 36% were obese. [Figure 2]

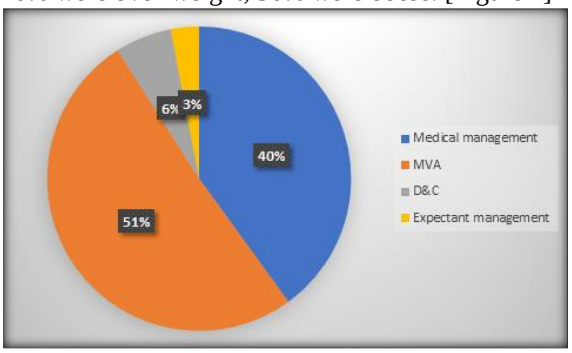

Figure 1: Distribution of the study participants based on type of management

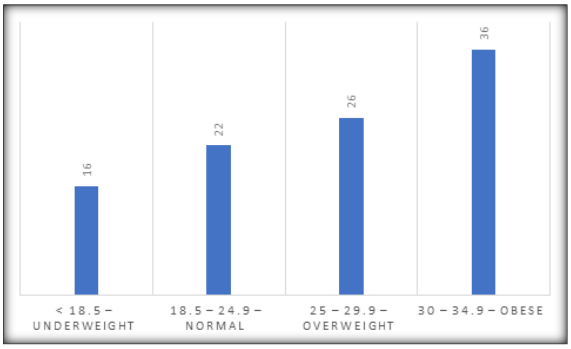

Figure 2: Distribution of study participants based on body mass index (BMI)

Table 2: Demographic distribution of the study participants

Age distribution	Frequency	Percentage
< 20 years	7	7%
21-25 years	19	19 %
26-30 years	10	10 %
31-35 years	37	37 %
>36 years	27	27 %
Education		
Illiterate	16	16%
Primary school	22	22%
Secondary school	36	36%
Intermediate	19	19%
Graduate	7	7%
Occupation		
Unemployed	66	66%
Employed	34	34%
Socio-economic status		
Lower	22	22%
Lower-middle	30	30%
Middle	28	28%
Upper middle	16	16%
Upper	4	4%
Type		
Referred case	15	15%
Booked case	77	77%
Un-booked case	8	8%

Table 3: Classification of participants based on obstetric history

Gravida	Frequency	Percentage
Primi	36	36%
G2	28	28%
G3	19	19%
G4	6	6%
G5	11	11%
Gestational age		
< 6 weeks	32	32%
6 – 9 weeks	42	42%
10 – 13 weeks	26	26%
No. of abortions		
No abortions	48	48%
1 abortion	16	16%
2 abortions	22	22%
> 3 abortions	14	14%

Table 4: Classification of subjects based on presence of co-morbidities

Co-morbidities	Frequency	Percentage
Anaemia	24	24%
DM	13	13%
HTN	6	6%
Hypothyroidism	11	11%
Surgery on cervix	7	7%
No co-morbidity	39	39%

Table 5: Chief presenting complaint of the subjects

Symptoms	Frequency	Percentage
Nausea/vomiting	5	5%
Dizziness	12	12%
Pain abdomen	23	23%
Bleeding	42	42%
No symptoms	18	18%

Table 6: Distribution of study participants based on diagnosis – type of abortion

Diagnosis	Frequency	Percentage
Complete abortion	44	44%
Incomplete abortion	31	31%
Missed abortion	18	18%
Septic abortion	7	7%

Table 7: Complications experienced by the study participants

Complication	Frequency	Percentage
Anaemia	20	20%
Hypovolemic shock	5	5%
Haemorrhagic shock	2	2%
Septicaemia	2	2%
No complication	71	71%

DISCUSSION

Miscarriage is the most common complication of pregnancy and approximately 1 in 5 pregnancies end in abortion in the first trimester. In the present study, 100 subjects were enrolled and various risk factors and management methods have been studied. In this study, the age group of 7% subjects was less than 20 years, 19% were between 21-25 years, 10% were between 26-30 years, 37% were between 31-35 years and 27% were above 36 years of age. This shows the age group at which the patient experienced a pregnancy loss. Majority of the women who had a miscarriage belonged to the age group of 31-35 years and the least belonged to women under 20 years. In a study conducted by Andersen et al,[6] most early loss of pregnancy occurred in the age group of 40-44 years and least miscarriages were observed in the age group of 12-19 years. Unlike the present study, the most miscarriages occurred in an older age group while similar result was seen in age with least miscarriages, being < 20 years. Findings similar to the present study were seen in a study by Magnus et al,[7] where the age of 30-34 years had the most risk for miscarriages and age <20 years had the least risk.

Among the study participants in the current study, 16% were illiterate while 84% had at least primary school education. Dhaded et al,[8] reported that the relative risk of miscarriage in association with education of the mother was 0.93 in women with no formal education, 0.95 in women with secondary education and 1.00 in women who had university education. The association of occupation of the mother and the risk of having a miscarriage was studied and in the current study, it was observed that 66% of the participants were unemployed and 34% were employed. Bonde et al,[9] conducted a study to estimate the risk of miscarriage with hours of work and shifts of work and they found that the relative risk of having an abortion when the woman worked fixed night shifts was 1.51 and working in 3-shift schedule, carrying heavy weights at work and prolonged standing ranged from 1.12 – 1.36. However, no conclusive evidence was found that associated these variables to a risk of having an early pregnancy loss.

The risk of early loss of pregnancy was found to be higher in low-income settings like rural areas in a study conducted by Zheng at al.[10] It was observed that the risk of miscarriage was 1.68 times greater in rural compared to urban areas. It was also found that the incidence of early loss of pregnancy was lesser in well educated women. However, in the present study, women belonging to lower middle class (30%) showed a greater incidence of early loss of pregnancy. Similar to the study by Zheng et al,[10] women from higher socio-economic class, like upper middle (16%) and upper class (4%) had lesser incidence of abortion. Norsker et al,[11] also studied the association of education and income on the risk of miscarriage. This study found that income levels

were significantly associated to the risk of miscarrying with a p-value of 0.04.

In the present study, it was found that the women were pregnant for the first time, i.e. primigravida patients had more incidence of early pregnancy loss, followed by second gravida and was least in women with gravida 4 and above. Contrary to the present findings, the rate of miscarriage increased in women with higher parity compared to women with lower parity in a study by Cohain et al.[12] It was observed that nulliparous women had 81.5% of not having a miscarriage while subjects with a parity of 5 to 11 had only 26% chance of not having an early pregnancy loss .

The gestational age of the patient at the time of abortion was studied and it was observed that majority of the women who experienced a pregnancy loss were having a gestational age between 6 – 9 weeks (42%) and the least were between 10 – 13 (26%) weeks. Similar results were found in a study conducted by O'Dwyer et al,[13] where the mean gestational age at miscarriage was 10.3 ± 2.5 weeks. It was also found that women who miscarried presented early for sonographic examination compared to those women who didn't.

The past obstetric history was studied in association with spontaneous abortion by Regan at al and it was observed that 19% of pregnancies where the last pregnancy ended in abortion also aborted spontaneously and only 4% of those who did not have abortion in the past experienced early loss of pregnancy this time.[5] Contrary to this, in the present study, it was observed that 48% subjects had no history of miscarriage and most miscarriages were seen in subjects with at least 2 abortions in the past. Similar results were found in study by Chavan et al,[14] where 78% of subjects had no history of miscarriage and 22% of the subjects had a history of at least one miscarriage.

The presence of co-morbidities and its association with miscarriage was studied by Magnus et al,[15] and it was observed that there was increased risk of miscarriages in women with cardio-metabolic diseases (OR 1.25, p-value <0.01). the odds of miscarriage for diabetes was 1.3, hypertensive disorders was 1.19 and hypoparathyroidism was 2.58. In the present study 39% of the subjects had no co- morbidities, 24% had anaemia, 13% had diabetes mellitus, 11% had hypothyroidism, 6% had hypertension and 7% has a history of surgery.

The chief presenting symptom was inquired into and it was found in the current study that the most common presenting symptom among the subjects was bleeding PV (42%). It was followed by pain abdomen in 23% subjects, dizziness in 12%, nausea/vomiting in 5% subjects. It was observed that 18% had no symptoms and had come for routine visit. Sapra et al,[16] conducted a study to study the incidence of clinical features in women with early loss of pregnancy. It was found in this study that the incidence of vaginal bleeding in miscarriage was 7 – 21% and the incidence of vomiting was 46 – 56%.

In the present study, the subjects were classified based on the type of abortion diagnosed. 44% of the subjects had complete abortion followed by 31% who had incomplete abortion and 18% had missed abortion. The incidence of septic abortion was only 7%. In a study by Cohain et al,[12] it was found that 12% of pregnancies underwent spontaneous abortion. Similar results were seen in a study by Chavan et al,[14] where the incidence of missed abortion was 15%, septic abortion was 8.4%, incomplete abortion was 44.9%, and complete abortion was 31.6%.

Management of early loss of pregnancy involves medical management, surgical management and expectant management. In the current study, 51% of the subjects underwent MVA, 40% underwent medical management, 6% D & C and 3% underwent expectant management. Graziosi et al,[5] conducted a study on the management of abortion and they found that among women with missed abortion, expectant management had 28% success rate and medical management had 85% success rate. In women with incomplete abortion, expectant management had 94% success rate and medical management had 99% success rate.

Among the subjects of the current study, 71% had no complications, 20% had anaemia, 5% hypovolemic shock and 2% had haemorrhagic shock and septicaemia. Ina study by Allison et al,[1] it was shown that 22% who had MVA had repeat uterine aspiration, 0.3% had uterine perforation. The overall complications were 2.5%. In the present study, it was observed that majority of the participants who had a miscarriage were overweight (26%) and obese (36%). In a study by Al-Hakmani et al,[17] found similar results, where 34% were obese, 31% were overweight and 35% were normal weight. It was observed that obese women were at a higher risk of developing chronic diseases and bad pregnancy outcomes. Malasevskaia et al,[18] also conducted a study to determine the effect of obesity on pregnancy loss and the odds of experiencing a pregnancy loss was found to be 1.45 times higher in obese women than in women with normal-weight adjusted odds ratio (AOR) = 1.45; 95%Cl: 1.06, 1.98, P = 0.021 in obese women.

CONCLUSION

After analysing the data and comparing the results, the following conclusions have been drawn from the study. The age at which most early pregnancy losses occurred was between 31-35 years followed by >36 years. The incidence was least below the age of 20 years. The occurrence of early pregnancy loss was observed to be more in educated subjects when compared to illiterate subjects. Early pregnancy loss more common in women who were unemployed when compared to employed women. The rate of

early pregnancy loss was lower in women belonging to upper class when compared women who belonged to lower socio-economic class and was most in lower-middle class women. It was observed in the present study that majority of the participants were booked cases, compared to referred and un-booked cases. The present study showed that rate of early loss of pregnancy was maximum in those women who were conceiving for the first time compared to women who have conceived before. It was observed in the present study that majority of the early pregnancy losses occurred in the gestational age of 6 – 9 weeks compared to the other gestational ages in weeks. The previous history of abortions was investigated and it was found that of the women who had a miscarriage, majority had no history of a previous miscarriage and among those who experienced a previous miscarriage, a history of two previous miscarriages was most common. The presence of co-morbidities in the subjects was looked into and it was found that 39% had no co-morbidity and among those who had co-morbidities, majority had anaemia followed by diabetes, hypothyroidism, history of cervical surgery and hypertension. The chief presenting complaint of majority of the subjects was bleeding from the vagina followed by pain in abdomen, dizziness, nausea and vomiting. The major type of abortion that was diagnosed among the subjects was complete abortion followed by incomplete abortion, missed abortion and septic abortion. The majority of subjects were given MVA followed by medical management, D&C and expectant management. Complications followed by management were looked into and it was observed that majority of the subjects had anaemia followed by hypovolemic shock, haemorrhagic shock and septicaemia. The body mass index of the subjects was also looked into and it was observed in the present study that majority of the subjects were obese followed by overweight, normal weight and underweight.

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