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Original Research Article

A clinical observational study on second-trimester abortion

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ABSTRACT

Background: Second-trimester abortion is an important component of the comprehensive women's health care. Data's regarding second-trimester abortion is still under-reporting. Though the percentage of induced second-trimester abortion is low, its morbidity is higher than the first-trimester induced abortion. The abortion related mortality usually increases with the age of gestation.

Methods: A retrospective observational study was conducted in the department of obstetrics and gynecology at Sree Balaji Medical College and Hospital, Chennai, over a period of one year. The data were collected from the medical case records and we have analyzed on the epidemiology, etiologies, complications and the methods of second-trimester abortion using statistical analysis.

Results: In this study, there was no standard regimen of mifepristone and misoprostol were used for second-trimester abortion. The dosages were varied based on the gestational age of pregnancy. As the gestational age progresses, the amount of misoprostol required for the induction of second trimester abortion decreases and the difference is statistically significant. There was no reported case of rupture uterus, but varied complications such as post-abortal hemorrhage, retained placenta, need for blood transfusion, uterine perforation and one maternal death were reported during the study period.

Conclusions: In order to reduce the morbidity and mortality of second trimester abortion, more policies and monitored services have to be rendered by the health system. Data regarding the second trimester abortion have to be improved.

Keywords: Abortion, Complications, Epidemiology, Etiology, Methods, Second-trimester

INTRODUCTION

Second-trimester abortion defines the miscarriages that are happening between 13 weeks and 26 weeks of gestation.¹ It is an important component of the comprehensive women's health care. Various medical and social reasons such as late detection of pregnancy, detecting major congenital anomalies in the fetus,

obstetric conditions such as preeclampsia, preterm premature rupture of membrane and fetal demise are the indications of second-trimester miscarriages.¹ The data regarding second-trimester abortion is still under-reporting. An abortion provider census states that, only 64% of them offers some services more than 12 weeks of gestation and only 23% of them offers services more than 20 weeks of gestation.¹

Modern medical abortion of second-trimester miscarriage uses one or more of the following such as mifepristone, misoprostol, osmotic cervical dilators, Foley catheter insertion and oxytocin as inducing agents. Mifepristone followed by misoprostol in 24-48 hours later is the most effective regimen for second-trimester abortion with 91% efficacy within 24 hours of initiation of misoprostol with the lesser side effects of misoprostol alone.¹ Surgical abortion by cervical softening and dilatation with osmotic dilators or misoprostol followed by dilatation and evacuation of the fetus is another method of termination of second-trimester pregnancy. Intact Dilatation and Evacuation is required, where the fetal anatomy is desired. Abdominal procedures such as hysterotomy or hysterectomy may require for some cases where the medical and surgical abortion fails.¹ The methods such as intra or extra amniotic instillation of ethacridine lactate is outdated by WHO, which was previously used for termination of late second-trimester abortions, as it had adverse effects of long duration of labor, hospitalization for many days and may need for curettage.¹

The mortality rate associated with abortion is 0.6 per 1,00,000 legal induced abortions. Abortion related mortality usually increases with each week of gestation. It is 0.1 per 1,00,000 procedures at 8 weeks of gestation and 8.9 per 1,00,000 procedures at 21 weeks of gestation or later.¹ Complications such as post abortal hemorrhage, cervical laceration, retained product of conception and infection can occur in both surgical and medical method of abortion. Uterine perforation is a complication of Dilatation and Evacuation and rupture uterus is a complication of medical abortion.¹ Limited data is available for the usage of mifepristone for the abortion more than 14 weeks, but further studies is required for the same. Risk of uterine rupture occurring with prior caesarean delivery is same as that without previous caesarean section, so the guidelines suggests medical abortion particularly the usage of misoprostol for previous one caesarean delivery.¹

METHODS

This was a retrospective clinical observational study conducted in the department of obstetrics and gynecology at Sree Balaji Medical College Hospital, Chromepet, Chennai over a period of one year from august 2015 to august 2016. The data were collected from the medical case records maintained in the hospital.

Inclusion criteria

- Patients who were all got admitted and treated for second-trimester abortions (i.e.) spontaneous or induced abortions between 12 weeks of gestation and 28 weeks of gestation
- Patients who got termination of pregnancy between 28 weeks and 32 weeks of gestation with fetus weighing less than 1 kg during the study period were included.

Exclusion criteria

- Patients having miscarriages before 12 weeks of gestation
- Patients who delivered or terminated the pregnancy after 28 weeks of gestation with the fetus weighing more than 1 kg.

There were about 65 cases of second-trimester abortion reported during the study period. The following data such as age, parity, previous mode of delivery, gestational age of abortion, spontaneous or induced second-trimester abortion, indications for induced abortion, method of induction, (a) medical (total dose of mifepristone and total dose of misoprostol), (b) mechanical (Foley insertion), (c) surgical (dilatation and evacuation, hysterotomy), abortion induction - expulsion interval, post abortal complications if any were noted from the medical case records of the patients. Data's were collected and analyzed by using statistical methods.

Statistical analysis

The data were collected and enter into Microsoft excel and analyzed using statistical software. The descriptive statistics were mentioned using mean, median, frequencies, standard deviations and interquartile range. The inferential statistics were done using appropriate test like Chi square and Kruskal Wallis Test.

RESULTS

The age distribution of second trimester abortion patients and its statistics in this study are as shown in the Table 1 and 2, with total no of patients N = 65, with the mean age of 25.95, with the minimum age of 18 and the maximum age of 45, with the median age of 25 and with standard deviation of 5.054.

Table 1: Distribution of age in second trimester abortion.

Age distribution	Frequency
<= 19 years	4
20-24 years	25
25-29 years	22
30-34 years	10
35-39 years	3
40-44 years	0
> 45 years	1

Table 2: Statistics of age distribution.

N	Age (N = 65)
Mean	25.95
Median	25.00
Standard deviation	5.054
Minimum	18
Maximum	45

The second trimester abortion is more frequent in primi gravida with 41.5% incidence, followed by second gravida, third gravida and fourth gravida with the incidence of 27.7%, 16.9%, 9.2% respectively and the incidence is least among the fifth gravida with 4.6%.

Table 3: Marital status and consanguinity of marriage.

Marital status	Frequency	Percent
Unmarried	6	9.2%
Married	59	90.8%
Non-consanguineous	50	76.9%
II nd degree consanguinity	5	7.7%
III rd degree consanguinity	10	15.4%
Total	65	100%

Marital status and consanguinity of marriage in the study group are as shown in the Table 3. Among the 65 patients who had second trimester abortion, around 9.2% were unmarried and the remaining 90.8% were married women. The second trimester abortion was most common in non-consanguineous couple with the frequency of 50 people i.e. 76.9%, followed by III-degree consanguineous couple with the frequency of 10 (15.4%), and it was least common in II-degree consanguineous couple with the frequency of 5 (7.7%).

Table 4: Distribution of previous mode of delivery in second trimester abortion.

Previous mode of delivery	Frequency	Percent
Primigravida	27	41.5%
Previous normal vaginal delivery	23	35.4%
Previous LSCS	7	10.8%
Previous normal vaginal and LSCS	3	4.6%
Only abortions	5	7.7%
Total	65	100%

The distribution of previous mode of delivery, among the second trimester abortion in the study group is as shown in the Table 4. In this study, 41.5% patients are primigravida. In the remaining, 35.4% patients had previous normal vaginal delivery, 10.8% had either previous one or two caesarean deliveries, 4.6% had previous mode of both normal vaginal delivery and caesarean delivery and 7.7% had previous one or two miscarriage in the past.

In the study group 53 patients i.e., 18.5% had a previous history of abortion with or without previous vaginal or caesarean delivery or both and the remaining 12 patients i.e., 81.5% had no such previous history of abortion.

Among the 65 patients who had second trimester abortion, 44 patients had no other co-morbidities, 9 patients were hypothyroid, 2 patients had bronchial

asthma, another 2 patients had type II diabetes Mellitus and another 2 patients had seizure disorder, 1 patient had anemia, another one had hyper-prolactinemia, another one was an old case of PT with Epilepsy complicating and another one was a psychotic disorder patient on treatment.

Table 5: Mode of onset and etiology of second trimester abortion.

Onset of abortion	Frequency	Percent
Spontaneous	18	27.7%
Cervical incompetence	3	4.61%
Complete abortion	7	10.8%
Incomplete abortion	8	12.3%
Induced	47	72.3%
Congenital anomalies	9	13.85%
Oligo/anhydramnios	4	6.15%
Vesicular mole	1	1.53%
MTP	8	12.3%
Over counter drugs	4	6.15%
IUD	3	4.61%
Missed abortion	16	24.61%
Medical condition of mother	2	3.08%
Total	65	100%

Table 6: Method of induction of second trimester abortion.

Method of Induction	Frequency	Percent
Spontaneous	10	15.38%
Medical	39	60.02%
Combined (mechanical and medical)	12	18.46%
Surgical D and E	3	4.61%
Hysterotomy	1	1.53%
Total	65	100%

Table 7: Gestational age distribution among second-trimester abortion.

Gestational age distribution	Frequency	Percent
12 weeks - 16 weeks	39	60.0%
16 weeks +1 day - 20 weeks	13	20.0%
20 weeks +1 day - 24 week	6	9.2%
24 weeks +1 day - 28 week	4	6.2%
> 28 weeks (fetus weighing less than 1 kg)	3	4.6%
Total	65	100%

The mode of onset of second trimester abortion and its various etiologies in the study group are shown in the Table 5. In this study, 18 patients of the study group had spontaneous second trimester abortion which is about 27.7%. Among the 18 patients, 3 patients had cervical incompetence, 7 patients had complete abortion and 8 patients had incomplete abortion, which required further either medical or surgical method of completion of

termination of pregnancy. 47 patients had induced second-trimester abortion which is about 72.3%. 16 patients had induced abortion due to missed abortion, 9 patients were induced due to lethal congenital anomalies, 8 patients had induced abortions due to various social reasons, 4 patients had induced themselves by the over counter drugs, 4 patients were induced due to severe oligohydramnios, 3 patients were induced due to intrauterine fetal demise, 2 patients were induced due to the medical condition of mother, of which one was psychotic and the another was status epilepticus and 1 patient was induced for partial molar pregnancy.

The various methods used for the induction of the second trimester abortion in this study group is shown in the Table 6. Among the 18 patients who had spontaneous onset of abortion in the study group, 10 patients had spontaneous second trimester abortion which doesn't require any further intervention, 2 patients required surgical dilatation and evacuation and the remaining 6 patients managed medically with misoprostol regimen.

Among the 47 patients who were induced for various etiologies, 12 patients were induced by both mechanical Foley insertions combined with misoprostol regimen, 33 patients were induced with combined mifepristone and misoprostol or misoprostol alone regimen, 1 patient of partial molar pregnancy required surgical D and E, and another one required hysterotomy in whom where all the combined and medical methods failed.

The distribution of gestational age of second trimester abortion in this study is as shown in the Table 7. From the study, the second trimester abortion is most common between 12 weeks and 16 weeks of gestation with 60% occurrence, followed by 20%, 9.2%, 6.2% occurrence between 16 weeks +1 day to 20 weeks, 20 weeks +1 day to 24 weeks, 24 weeks +1 day to 28 weeks respectively, and it is least common after 28 weeks of gestation with 4.6% in occurrence (termination of pregnancy more than 28 weeks of gestation with the fetus weighing less than 1 kg was included in this study as second trimester abortion).

Table 8: Mifepristone dose used for second trimester abortion.

Mifepristone dosage used	Frequency	Percent
Spontaneous abortion	18	27.7%
Mifepristone not given for IA	23	35.4%
200 mg of mifepristone given for IA	11	16.9%
400 mg of mifepristone given for IA	1	1.5%
600 mg of mifepristone given for IA	12	18.5%
Total	65	100%

IA: induced abortion.

Table 9: Statistics of total dose of Misoprostol in mg given for second-trimester abortion.

N	Dose (N = 65)
Mean	506.15
Median	400.00
Mode	0.00
Standard deviation	488.02
Minimum	0.00
Maximum	2000

The dose of mifepristone given for second-trimester abortion in this study is as shown in the Table 8. 27.7% of patients had spontaneous second trimester abortion. In the remaining 73.3% of induced patients, 35.4% of the patients did not receive mifepristone to induce the second trimester abortion, 16.9% of the patient received 200 mg of mifepristone for induction, 1.5% of the patient received 400 mg of mifepristone for induction and 18.5% of the patient received 600 mg of mifepristone for the induction of second trimester abortion.

The statistics of total dose of misoprostol used for second-trimester abortion in this study is as shown in the Table 9. The mean value of total dose of misoprostol given for second-trimester abortion in this study is 506.15 mg with its median value of 400 mg, the mode is 0.00 mg with the standard deviation of 488.02 mg. The minimum dose of misoprostol given in this study is 0.00 mg with the maximum dose of misoprostol of 2000 mg in divided doses.

The correlation between gestational age and the required dose of Misoprostol for induced second-trimester abortion is as shown in the Table 10. It shows that as the gestational week progresses, the total dose of Misoprostol required for induction of second trimester abortion decreases and the difference is statistically significant by Kruskal Wallis test p value 0.004.

Table 10: Correlation between gestational age and required dose of Misoprostol in mg for second-trimester abortion.

Gestational age in weeks	Misoprostol dose median (IQR) in mg	Table value	p value
12 weeks - 16 weeks	800 (0, 1000)	15.04	0.004
16 weeks+1 day - 20 weeks	200 (0, 500)		
20 weeks +1 day - 24 week	100 (0, 500)		
24 weeks +1 day - 28 weeks	75 (0, 200)		
> 28 weeks	50 (0, 100)		

p value is significant. Kruskal Wallis test.

The induction-abortion interval noted in second trimester abortion either after the onset of pain in spontaneous abortion or after taking the first dose of misoprostol in induced abortion in the study group is as shown in the Table 11, and its statistics is shown in the Table 12. By statistics, the mean induction-abortion interval in this study is 15 hours and 35 minutes, with the median interval of 12 hours and with the mode of 6 hours. The minimum induction-abortion interval is 1 hour and 30 minutes and the maximum interval is 62 hours in this study.

Table 11: Induction abortion interval of second-trimester abortion.

Induction abortion interval	Frequency
0-6 hours	17
6 -12 hours	16
12-18 hours	13
18-24 hours	6
24-30 hours	5
30-36 hours	2
36-42 hours	1
42-48 hours	3
More than 48 hours	2

Table 12: Statistics of induction abortion interval of second trimester abortion.

Statistics of induction-abortion interval	N = 65
Mean	15 hours and 35 minutes
Median	12 hours
Mode	6 hours
Minimum	1 hour and 30 minutes
Maximum	62 hours

Table 13: Complications during the second trimester abortion.

Complications	Frequency	Percent
No complications	48	73.8%
Primary hemorrhage	4	6.15%
Drug induced fever	2	3.07%
Post-abortal pyrexia	1	1.53%
Retained product of conception	1	1.53%
Adherent placenta	2	3.07%
Blood transfusions	10	15.38%
Uterine perforation	1	1.53%
Maternal death	1	1.53%

The various complications encountered during the second trimester abortion in the study group are listed in the Table 13. 48 patients in the study group didn't have any complications, 4 patients had primary post-abortal hemorrhage and 10 patients required one or more blood transfusions, 2 patients had adherent placenta which

required manual removal of placenta, 1 patient had retained product of conception, 2 patients had drug induced fever, 1 patient had post abortal pyrexia, and 1 patient of vesicular mole had uterine perforation complicated with ileal perforation which required laparotomy with primary closure, and 1 patient who was unbooked second-trimester IUD was expired due to pulmonary embolism inspite of resuscitative measures.

DISCUSSION

Worldwide, second-trimester abortion constitutes about 10-15% of all induced abortions, but it is related to two-thirds of abortion related complications and morbidities.² Since last two decades, second-trimester induced abortion can be efficiently and safely performed by medical methods. Due to the various complications during second-trimester abortion it is always advised to have that in a center with operating facility and with blood transfusions and referral for transport if necessary.²

In India, statistics and studies on second-trimester miscarriage is scanty. Though there is a belief that second-trimester miscarriage is more common in India, the data so were collected does not emphasize the same.³ A study states that there were 3 illegal abortions for one legal abortion in rural area and 4-5 illegal abortion for one legal abortion in urban area. But it doesn't differentiate between the first and second-trimester abortions.³ Studies based on the gestational age of abortion states that, the first trimester abortion is commoner than the second-trimester abortion, but the morbidity is higher in second trimester abortion.³ It is estimated in 1964 before the MTP act, that for every 73 live births, 15 induced abortions were reported.⁴ A study in 1996 states that, 26% of 1717 abortion was second-trimester abortion among which 3% was beyond 20 weeks.⁵ Statistics from Government of India in the year 2003 states that, 11% of abortion were happened in second-trimester.

A study in 2006, states that, the unintended pregnancy was the commoner reason for second-trimester abortion than the sex determination.⁶ In some region strong preference of male child with abandonment of girl child by finding the sex of fetus by ultrasound followed by second-trimester abortion was practiced. One study in Maharashtra states that second-trimester abortion is commoner in unmarried women rather than in the married women.⁷

According to MTP act 1971, for the termination of second-trimester pregnancy it requires two registered medical practitioners to confirm that there is a valid reason for termination.⁸ Most of the fetal anomalies cannot be diagnosed or confirmed in first trimester and due to the radiological inventions in antenatal detection of fetal anomalies, the therapeutic abortions based on these grounds have to be taken in second trimester or even in the third trimester and hence the increasing

incidence of second trimester abortions in India. Some maternal health conditions, physical and mental, may also be identified in later pregnancy which warrants termination.

The MTP amendment Act in 2003, passed by Indian Parliament decentralizes the clinic registration process to the district level which facilitates the registration of private abortion clinics.⁹ After 45 years of legalization of MTP in India, there was about steady decline in sex ratio of female decided to track the pregnancy once it was confirmed in order to avoid the second-trimester abortion after the sex determination.

The standard method for second trimester abortion is medical abortion after the introduction of combined mifepristone and misoprostol regimen, where the mifepristone shortens the induction-abortion interval and also reduces the total dose of prostaglandin analogue requires for the second trimester abortion. The medical abortion was carried out up to 24 weeks successfully in various studies.¹⁰ In this study medical abortion was successful even up to 32 weeks. Due to the increased sensitivity of prostaglandins during second trimester, the dose of the same required for second trimester abortion is also less.¹¹ This study also confirms the same.

A case series showed 2.5-11% of women required surgical intervention following medical abortion in second trimester of pregnancy.¹² This study showed, 6.1% required surgical intervention for second trimester abortion following medical methods. Another study states that heavy bleeding which requires blood transfusion was only less than 1%, but this study showed that, 15% of women required blood transfusion.¹³

Various many studies stated that the median induction-abortion interval is 5.9-6.6 hours.^{14,15} In this study it is about 15 hours and 35 minutes. This variation might be due to the factor that the standard combined mifepristone-misoprostol regimen had not followed in this study.

In this study, it was seen that no standard mifepristone-misoprostol regimen was given to the patients. The dosage of both mifepristone and misoprostol was varied according to the gestational age, but the success rate of medical abortion even up to 32 weeks was almost 93.85% without the complication of rupture uterus but other mentioned complications were encountered during the study period.

CONCLUSION

The health system has to reduce the mortality and morbidity from second-trimester abortion by delivering improvised and monitored services. In order to avoid second trimester abortion, all pregnancies have to be monitored from conception till delivery, more stringent action against quackery of sex detection has to be done. Greater information and data pertaining to the second-

trimester abortions are required in order to motivate and to bring a change. Lastly, there is an urgent need for national policy which addresses safe abortion within the context of women's sexual and reproductive rights.

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