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First Trimester Missed Miscarriages and Medical Management: A Single Centre Descriptive Study

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Abstract

Introduction: First trimester missed miscarriage is a relatively common situation among pregnant women. Three basic management options for this are expectant, medical and surgical. Medical management with Misoprostol is a safe and effective way out of these three methods.

Objectives: Aim is to describe the demographic, obstetrics and radiological factors associated with managing first trimester missed miscarriage with Misoprostol.

Method- Single centre descriptive study was conducted in a Teaching Hospital in Sri Lanka. Medically managed first trimester missed miscarriage (<12 weeks) were selected. Data retrieval was done using the bed head tickets. SPSS software was used to analyse the data.

Results: 167 women were recruited for the analysis. Overall success rate of vaginal Misoprostol was 62.3%.

Conclusion: This study provides an important overview of the clinical and demographic characteristics of patients treated for first trimester missed miscarriage in our institution.

Keywords: early pregnancy loss; miscarriages; misoprostol

Introduction: Background

Loss of the pregnancy within first 12 weeks is considered as early pregnancy loss or failure [1]. If this is diagnosed before passing products of conception, condition is called as missed miscarriage. This is a common entity in daily Obstetrics and Gynaecology practice. One in four women will encounter this during their life time [2]. Half of the spontaneous miscarriages are due to abnormalities of the chromosomes in the conceptus [3]. first trimester missed miscarriage leads to significant amount of social, psychological and physical trauma to a pregnant lady. This may put her in to increased risk of depression and anxiety for up to one year from the pregnancy loss [3]. Some of the side effects like bleeding and infection may be a life-threatening event to a pregnant woman. As this is a significant issue among women in their reproductive life, its management should be optimized to reduce the mental, physical and social trauma on the woman. Three basic available options to manage early pregnancy loss are expectant, medical and surgical. All these methods have unique risks and benefits. A woman with incomplete miscarriage, but hemodynamically stable and free of infection will be a good candidate for expectant management. This is the first line management option suggested by NICE guideline as it can be managed as an outpatient [4]. Even though this is free of side effects related to drugs and surgery, longer time taken for the complete recovery may interfere with the woman's quality of life [5].

Suction evacuation is best suited for hemodynamically unstable patient as it provides rapid recovery which gained the popularity over the last 50 years which performed under general anaesthesia in an operation theatre. Anaesthesia related complications, uterine perforation, cervical injuries, heavy bleeding, localized pelvic infections and requiring repeat suction are the common complications associated with this [6]. Place of the medical management for first trimester missed miscarriage gained the attention of the developing pharmaceutical world during last few years. As a result of that, suitability of surgical management as the first line treatment option for the management of first trimester missed miscarriage were questioned [7-9]. Misoprostol and Mifepristone gained the best attention as the drugs of choice out of all the pharmaceuticals for the medical management of first trimester missed miscarriage. Unique characteristics of the Misoprostol (15-deoxy-16-hydroxy-16-methyl PGE1) have been able to gained significant place in medical management of first trimester missed miscarriage. Other than using in this purpose,

Misoprostol is widely used in Obstetrics and Gynaecology for cervical ripening before uterine instrumentation, induction of labour, prevention and treatment of post-partum haemorrhage due to uterine atony [10].

One advantage of Misoprostol is it can be absorbed in various routes including oral, sublingual, vaginal and rectal. Misoprostol acid is the metabolite produce from the liver after the metabolism which causes cervical ripening, uterine contractions, gastric acid secretion reduction by acting on prostaglandin receptors. Misoprostol acts on both gravid and non-gravid uterus. Nausea, vomiting, diarrhoea, abdominal cramps and fever are few common side effects of this drug [11-13]. Misoprostol was licensed to use in Sri Lanka according to the circular that was issued by the Ministry of Health [10]. Extra care should be taken when use this drug on patients with asthma, cervicitis, vaginitis, hypertension or hypotension, anaemia, jaundice, diabetes or epilepsy. Misoprostol should not be used in patients with acute pelvic inflammatory disease, hypersensitivity to Misoprostol, active renal, hepatic or cardiovascular disorder. Uterine rupture and malignant hyperthermia are the life-threatening side effect of this medication [10]. Selecting the best candidate for the medical management thus plays a major role.

Material and methods

This retrospective descriptive study was conducted at Teaching Hospital, Mahamodara, Galle (THMG), Sri Lanka to describe the demographic, obstetrics and radiological parameters associated with first trimester pregnancy loss and its medical management. Ethical clearance was obtained from the university Ethical review committee and administrative approval was gained from the Director of THMG.

first trimester missed miscarriage was diagnosed according to the NICE guidelines and included into the study. This diagnosis was based on ultrasound scan findings [5]. Embryonic miscarriage was diagnosed according to following two criteria.

1. When crown-rump length (CRL) <7mm with a transvaginal ultrasound scan (TVS), absence of cardiac activity should be confirmed in at least two consecutive TVS which were done at least 7 days apart.
2. When CRL>7mm with a TVS, absence of fetal cardiac activity should be confirmed by two independent operators.

Anembryonic miscarriage was diagnosed with following two criteria.

1. When the mean gestational sac diameter (MGSD) is less than 25mm with a TVS, absence of fetal pole should be confirmed in two consecutive TVS which were done at least seven days apart.
2. When the MGSD is more than 25mm with a TVS, absence of a fetal pole should be confirmed by two independent operators.

Post Misoprostol endometrial thickness measured in mid sagittal plane with a TVS, less than 15mm was considered as complete uterine evacuation or successful medical management [14].

Patients with first trimester missed miscarriage with less than 13 weeks of menstrual gestational age (which correspond up to 90 days) who were managed with two doses of 800 micro grams vaginal Misoprostol in two doses which were given 3 hours apart (Ministry of Health guideline [10]) were selected to this study as the study population. Misoprostol issuing register was used to identify the patients.

Following patients were excluded from the study.

- Significant amount of missing data
- Uncertain menstrual period
- Not complied with the existing protocol.

Sample size was calculated by the G power software. Eligible patient's bed head tickets were retrieved by the record room with prior permission. Data collecting officer (who was well trained in collecting data) used a pre-tested validated data retrieval sheet to collect data from the bed head tickets. This was done under direct supervision of the researcher.

Results

The total number of cases available for analysis was 167 out of 208, with 40 features recorded (Table 1: Features Collected). Two additional features were derived by combining two recorded data points (POA in Days from POA Weeks and POA Days Components, Blood Group from ABO and Rh components).

Table 1: Features Collected

Feature	Type
Age	Numerical
Ethnicity	Categorical
Education Level	Categorical
Employed	Categorical
Employment	Categorical
Height in cm	Numerical
Weight in kg	Numerical
BMI (kg/m²)	Numerical
Total Pregnancies (including this pregnancy)	Numerical
Number of Living Children	Numerical
Number of Vaginal Deliveries	Numerical
Number of Caesarean Sections	Numerical
Total Caesarean Sections	Numerical
Previous Myomectomies	Categorical
Previous Classical Caesarean Sections	Categorical
Congenital Uterine Anomaly History	Categorical
Previous Abortions	Categorical
Treatment for Previous Abortions	Categorical
Contraceptive Used Before Pregnancy	Categorical
Pregnancy Planned	Categorical
Last Menstrual Period Certain	Categorical
Vaginal Bleeding During Current Pregnancy	Categorical
Gravida (G)	Numerical
Parity (P)	Numerical
Children (C)	Numerical
POA - Weeks	Numerical
POA - Days	Numerical
POA in Days	Numerical
Bleeding through Cervical Os	Categorical
Gestational Sac Size	Numerical
Presence of Foetal Poles	Categorical
Crown-Rump Length	Numerical
ABO Blood Group	Categorical
Rhesus Blood Group	Categorical
Serum Beta hCG	Numerical
Interval Between Diagnosis and Treatment	Numerical
Anteroposterior Product Thickness	Numerical
Medical Management Result	Categorical
Next Step When Unsuccessful	Categorical
Side Effects Experienced by Patient	Categorical
Special Events During Hospital Stay	Categorical

Table 2: Descriptive Statistics of Numeric Features

Feature	N	Minimum	Maximum	Mean	Std. Deviation
Age	167	18	45	31.87	6.481
Height in cm	167	Missing	Missing	Missing	Missing
Weight in kg	167	Missing	Missing	Missing	Missing
BMI	167	Missing	Missing	Missing	Missing
Total Pregnancies	167	1	6	2.32	1.219
Living Children	167	0	4	1.04	0.959
Vaginal Deliveries	167	0	4	0.78	0.970

Caesarean Sections	167	0	2	0.25	0.557
Total Caesarean Sections	167	0	2	0.25	0.557
Gravida (G)	167	1	6	2.32	1.219
Parity (P)	167	0	4	1.10	0.961
Children (C)	167	0	4	1.04	0.959
POA - Weeks	167	4	12	10.22	1.611
POA - Days	167	0	6	2.74	2.004
POA in Days	167	30	90	74.29	11.327
Gestational Sac Size (cm)	167	1.20	7.00	4.05	1.42
Crown-Rump Length (cm)	120	0.40	6.70	3.29	1.67
Serum Beta hCG	167	Missing	Missing	Missing	Missing
Interval Between Diagnosis and Treatment	166	1	4	1.19	0.535
Anteroposterior Product Thickness	164	5.7	28.0	14.31	4.88

The mean age of patients was 31.87 with a standard deviation of 6.481 (Figure 1).

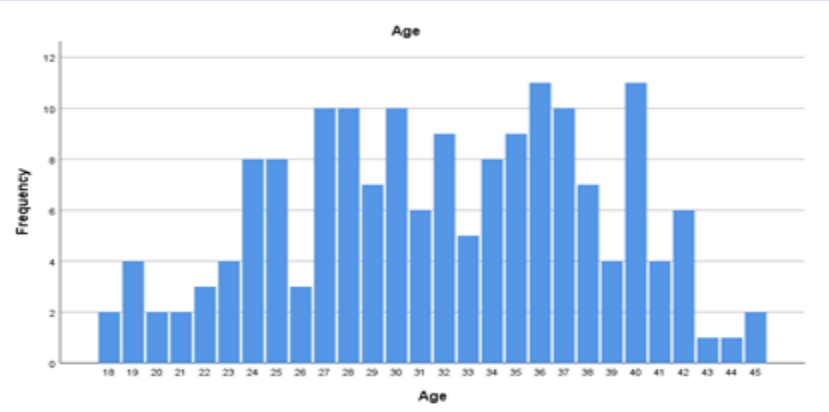

Figure 1: Age Distribution

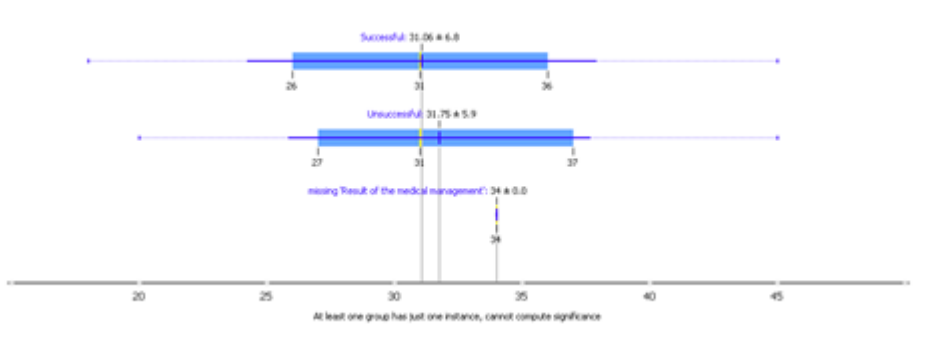

Figure 2: Age Statistics in Success and Failures

Table 3: Distribution of Ethnicity

Ethnicity	Frequency
Muslim	15
Sinhala	151
Tamil	1
Total	167

One hundred fifty-one patients were Sinhalese, 15 were Muslims, and 1 was Tamil

Table 4: Blood Groups

Blood Group	Frequency	Percent
Missing	28	16.8
A	30	18.0

AB	5	3.0
B	42	25.1
O	62	37.1
Total	167	100.0

The level of education, employment status, and contraceptive methods used were inconsistently recorded and thus excluded from analysis. The certainty of the last regular menstrual period was confirmed in 164 cases, with only 2 uncertain.

Table 5: Last Menstrual Period Certainty

Certainty	Frequency
Yes	164
No	2
Missing	1
Total	167

The total number of pregnancies, including the current one, varied: 54 patients (32.3%) had 1 pregnancy, 47 (28.1%) had 2, 32 (19.2%) had 3, 27 (16.2%) had 4, 6 (3.6%) had 5, and 1 patient (0.6%) had 6 pregnancies.

Table 6: number of pregnancies

Number	Frequency	Percent
1	54	32.3
2	47	28.1
3	32	19.2
4	27	16.2
5	6	3.6
6	1	0.6
Total	167	100.0

The number of living children was as follows: none in 59 (35.3%), one in 55 (32.9%), two in 41 (24.6%), three in 11 (6.6%), and four in 1 (0.6%).

Table 7: Number of Living Children

Number	Frequency	Percent
0	59	35.3
1	55	32.9
2	41	24.6
3	11	6.6
4	1	0.6
Total	167	100.0

The number of vaginal deliveries ranged from none (88 patients, 52.7%) to four (1 patient, 0.6%).

Table 8: Number of Vaginal Deliveries

Number of Vaginal Deliveries	Frequency	Percent
0	88	52.7
1	38	22.8
2	31	18.6
3	9	5.4
4	1	0.6
Total	167	100.0

Table 9: Number of Caesarean Sections

Number of Caesarean Sections	Frequency	Percent
0	135	80.8
1	22	13.2
2	10	6.0
Total	167	100.0

The history of previous abortions was recorded for 167 patients, with 34 (20.4%) reporting a history of abortion. The treatment for these abortions included medical management (30 cases), combined medical and surgical management (2 cases), and spontaneous expulsion (2 cases).

Table 10: History of Previous Abortions

Previous Abortions	Frequency
No	133
Yes	34
Total	167

Table 11: Treatment for Previous Abortions

Treatment Method	Frequency	Percent
Medical Management	30	18.0
Medical & Surgical Management	2	1.2
Spontaneous Expulsion	2	1.2
Total	167	100.0

Table 12: Gravida (G)

Gravida (G)	Frequency	Percent
1	56	33.5
2	46	27.5
3	42	25.2
4	20	12.0
5	3	1.8
6	0	0.0

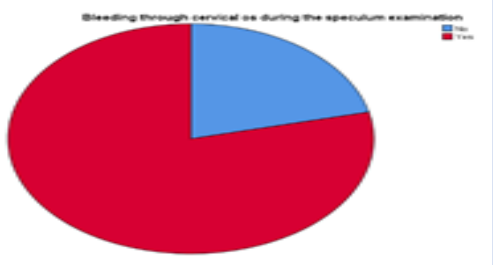

Figure 3: Bleeding through the cervical os during the speculum examination

Figure 4: History of per vaginal bleeding

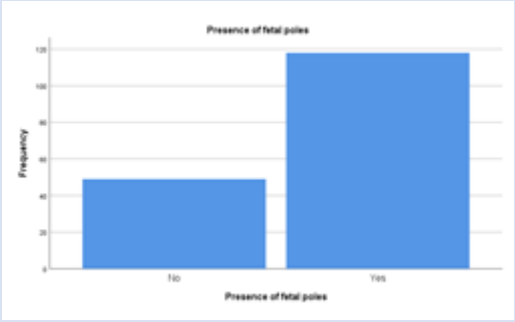

Figure 5: Presence of fetal poles

Table 13: Result of the medical management

Result of the medical management					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.6	.6	.6
	Successful	104	62.3	62.3	62.9
	Unsuccessful	62	37.1	37.1	100.0
	Total	167	100.0	100.0	

Table 14: Next management step for unsuccessful medical management.

If unsuccessful, what was the next step?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		105	62.9	62.9	62.9
	ERPC	51	30.5	30.5	93.4
	Repeat Misoprostol	11	6.6	6.6	100.0
	Total	167	100.0	100.0	

Table 15: Side effects profile

Side effects experienced by the patient					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		128	76.6	76.6	76.6
	Abdominal Cramps	2	1.2	1.2	77.8
	Abdominal Cramps, Faintishness	1	.6	.6	78.4
	Abdominal pain	1	.6	.6	79.0
	Faintishness	1	.6	.6	79.6
	Fever	14	8.4	8.4	88.0
	Fever, Chills	1	.6	.6	88.6
	Fever, Nausea, Vomiting	1	.6	.6	89.2
	Mild chest pain	1	.6	.6	89.8
	Nausea, Vomiting	15	9.0	9.0	98.8
	Nausea, Vomiting, Faintishness	1	.6	.6	99.4
	Tachycardia	1	.6	.6	100.0
	Total	167	100.0	100.0	

Discussion

This study aimed to explore the clinical and demographic characteristics of patients who underwent treatment for early pregnancy failure at our institution. The findings highlighted several important aspects, such as the predominance of Sinhalese ethnicity (90.4%), with a notable proportion of patients (37.1%) having blood group O.

The age of patients ranged from 18 to 45 years, with a mean of 31.87 years. Most patients (32.3%) had one pregnancy, and 35.3% had no living children, reflecting a diverse reproductive history. The relationship between the number of previous pregnancies and delivery mode revealed that a substantial proportion of patients (52.7%) had not undergone any vaginal deliveries, suggesting the

potential impact of previous cesarean sections or other complications. This finding aligns with the growing trend of cesarean deliveries observed globally. The number of patients with a history of previous abortions was 20.4%, and most of these cases (18%) were managed with medical methods. The presence of certain features, such as blood group distribution and gravidity, is consistent with findings from similar studies conducted in different regions. These characteristics are useful for understanding the patient profile and tailoring treatment protocols accordingly. However, as noted, the lack of consistency in the recording of some features (e.g., education level, employment status) poses a challenge to fully interpreting the socio-economic factors that could influence treatment outcomes. Even though success rate of the medical management in this study came as 62%, success rate which was reported by one of the previous Sri Lankan studies was 54% [15]. International literature shows that this varies between 54% to 84% [15-16]. Usage of different protocols, usage of Mifepristone, ethnic variation and time given for the drug activity may have contributed to these differences. Even though this study showed 8% side effect among the patients, this didn't show serious side effect like uterine rupture.

Limitations

Despite providing valuable insights, this study has several limitations. First, the sample size (167 patients) may not fully represent the broader population of patients experiencing early pregnancy failure, limiting the generalizability of the findings. Second, the inconsistent data recording for certain variables, such as education level and employment status, may have led to incomplete or biased conclusions regarding socio-economic factors. Additionally, a lack of follow-up data on long-term outcomes could prevent a comprehensive evaluation of the long-term effects of the treatments on the patients' future pregnancies and reproductive health. Furthermore, while we accounted for common clinical features, the study did not delve into more specific aspects, such as the genetic or environmental factors that may contribute to pregnancy failure.

Conclusion

In conclusion, the study provides an important overview of the clinical and demographic characteristics of patients treated for first trimester missed miscarriage in our institution. The findings suggest that factors such as age, parity, and previous obstetric history significantly influence the clinical approach and treatment outcomes. The study highlights the need for further research into the socio-economic and psychological factors associated with early pregnancy failure, as well as the development of more standardized data recording practices. Despite some limitations, the study offers useful insights for clinicians and policymakers working to improve care for patients with first trimester missed miscarriage.

Declarations

Conflict of interest

None.

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