

Role of mesoprostol in the management of first trimester incomplete abortion

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Abstract

Background and objectives: Surgical treatment has been a traditional way of treatment of incomplete abortion. Expectant management and medical treatment can reduce costs and complications generated by surgery. Current study was designed to determine the success rate of treatment of incomplete abortion by mesoprostol thus avoiding surgical intervention. Moreover, factors which can impair efficacy of the treatment were investigated.

Method: The sample size included 100 patients with first trimester incomplete abortion attending Maternity Teaching Hospital in Erbil city/ Kurdistan Region / North of Iraq between October, 1st 2009 and March, 1st 2010 being assigned to receive 400 µg mesoprostol orally. A week later the patients were specifically examined to verify that complete abortion had been occurred. A second dose was administered if complete abortion was not yet achieved, provided that the patient was hemo-dynamically stable and notably no substantial bleeding or infection been noticed.

Results: The success rate of the treatment was 62% and 93% after first and second dose respectively. The difference in response to the treatment was related to the difference in endometrial thickness and gestational age. No any serious complication was reported.

Conclusion: Mesoprostol administered orally is an effective method in treating first trimester incomplete abortion.

Keywords: Incomplete abortion, mesoprostol, spontaneous abortion.

Introduction

The term "miscarriage" is synonymous with spontaneous abortion and it is often used by the patients, as the word "abortion" is coded for elective termination of pregnancy.¹ Spontaneous abortion is defined as any pregnancy that terminated spontaneously before the fetus is survivable. World Health Organization defines this un-survivable state as an embryo or fetus weighing <500 gm or a gestational age of 22 weeks or less.² Miscarriage is a most common complication of early pregnancy. It occurs in approximately 15-20% of all pregnancies.³ An unpublished hospital data in Tanzania reveals that, incomplete abortion constitutes about 39% of all admissions to the gynecological wards. About 80% of

spontaneous pregnancy losses occur in first trimester, while mid-trimester losses occurs less frequently and constitutes less than 3% of all pregnancy outcomes.⁴ Incomplete abortion is a type of spontaneous abortion where some, but not all, of the products of conception has been passed, and retained products may be part of the fetus, placenta or membranes.^{1,2} In cases of incomplete abortion significant morbidity and mortality may occur if treatment is not performed in a timely manner. Patients with retained products of conception usually seek medical care with symptoms of bleeding, cramping and/ or infection.⁵ Aim of treatment of incomplete abortion is prevention of maternal complications, which are sepsis and hemorrhage.⁶ Methods of treatment of incomplete abortion are

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surgical evacuation, medical treatment and expectant management.^{7-9,10,11} Since nineteenth century, surgical evacuation of the uterus has been the standard treatment offered by gynecologists to those requiring treatment following first trimester abortion.¹² This surgical method is sometimes associated with complications, such as uterine perforation and creation of false passage, hemorrhage, cervical tear and laceration, Asherman syndrome, cervical incompetence, pelvic infection with risk of long term effects on subsequent fertility or pregnancy outcome.^{13,14} Medical treatment is going to be regarded seriously in many countries as a reasonable alternative in the past decade to universal surgical evacuation of the uterus in incomplete miscarriage.⁷⁻⁹ Investigations to date mainly focused on the use of mesoprostol (synthetic prostaglandin analogue).^{7,8,15} Mesoprostol is regarded to be a safe, effective and acceptable option for treating incomplete abortion.¹⁶⁻¹⁸ Mesoprostol may provide prompt expulsion of product of conception when given alone and avoid complications associated with surgical evacuation and uncertainties of expectant management.^{8,19} It has the advantage of easy availability, ease of administration, lower cost effects, stable at room temperature and having few side effects. It can be administered orally, buccally, sublingually, rectally and vaginally.²⁰

Method

The study was conducted on patients diagnosed to have incomplete abortion. The trial is conducted from October 1st, 2009-March 1st, 2010, at Maternity Teaching Hospital in Erbil city, Kurdistan region/ North of Iraq. Women who attended the out patient clinic and diagnosed to have incomplete abortion from history, clinical and ultrasound examination were included in the study and interviewed. The severity of bleeding experienced by the patient was assessed using a three scale system. Grade (1): For spotting or minimal bleeding. Grade (2): For bleeding equal to menstrual flow. Grade (3): For bleeding

more than menstrual flow with or without clots.²¹ Criteria for confirmation of diagnosis were evidence of retained products of conception (RPO) on trans-vaginal ultrasound examination or thick endometrium where the maximum antero-posterior endometrial thickness of 15 mm or greater was a criteria for study enrollment.^{22,23} Patients were tested for blood group, Rhesus factor and hemoglobin level. The exclusion criteria were:

- 1-Symptoms and signs of hemo-dynamic instability or shock status.
- 2-Any contraindication for use of mesoprostol as severe pulmonary diseases, heart diseases, prolonged use of corticosteroids, sickle cell anemia, adrenal insufficiency, hepatic failure and allergy to the mentioned drug.
- 3-Smokers.
- 4-Symptoms and signs of pelvic infections and /or sepsis
- 5-Suspicion of ectopic gestation
- 6-Patients who did not accept participation in the study.

Hundred patients were allocated to receive a single dose of 400µg of mesoprostol. Each tablet is composed of 200µg of the active ingredient. Two tablets were taken orally. A follow up visit was scheduled to occur a week later. A telephone interview was arranged to occur during this week to identify any health problem. During the visit patients were asked about amount of vaginal bleeding after treatment and the severity of such a bleeding and whether she has aborted. A vaginal examination supplied by a vaginal ultrasound examination was performed to determine whether she has aborted completely. Treatment success was defined as a complete abortion indicated clinically and confirmed by vaginal ultrasound examination where the endometrium should be homogenous and of antero-posterior thickness of <15 mm. In cases where a complete abortion was not achieved and the amount of bleeding was of grade (1), a second dose of mesoprostol 400µg was administered orally and the follow up visit was scheduled to happen one

week later. If still a complete abortion was not achieved then surgical evacuation was performed. The plan was to stop the study and perform surgical evacuation earlier if the patient developed infection and/or severe bleeding during the course of the treatment. Ethical approval: Informed verbal consent was obtained from all the patients. The study was approved by the scientific committee of the Medical College / Hawler Medical University. Data were analyzed using the statistical package for social sciences (SPSS version 15). Student's test was used to compare between two means and one way Analysis Of Variance (ANOVA) was used for three or more means. Simple linear correlation was used to calculate the correlation coefficient between two numerical variables. The Chi square test of association was used for categorical variables to show association between two variables. A 'P' value of ≤ 0.001 was considered to be statistically significant.

Results

Regarding the success rate of the treatment, 62 cases out of 100 (62%) was completely treated with the first dose of mesoprostol. The rate increases to 93% with the second dose and only 7 patients need surgical evacuation. Indications for surgical interference were:

- 1-Incomplete expulsion of the product of conception after the second dose of mesoprostol (6 cases).
- 2-Incomplete expulsion of the product of conception after the second dose of mesoprostol (6 cases).

When endometrial thickness is taken as a parameter which can affect the efficacy of the medical treatment, then the mean endometrial thickness in those responding to a single dose of mesoprostol was $(19.16 \pm 2.07 \text{mm})$ which was significantly less than those responding to two doses and those requiring surgical evacuation $(29.7 \pm 2.05 \text{mm})$ and $(26.5 \pm 1.15 \text{mm})$ respectively. $P < 0.001$.

The mean gestational age in those responding to a single dose of mesoprostol was $(8.79 \pm 1.18 \text{weeks})$, which was significantly less than those responding to two doses and those requiring surgical treatment $(11.3 \pm 0.74 \text{weeks})$ and $(11.57 \pm 0.53 \text{weeks})$ respectively. $P < 0.001$. There was no statistically significant difference between different age groups in their response to mesoprostol as shown in Table (1). Frequency of side effects after oral administration of mesoprostol is shown in Table (2).

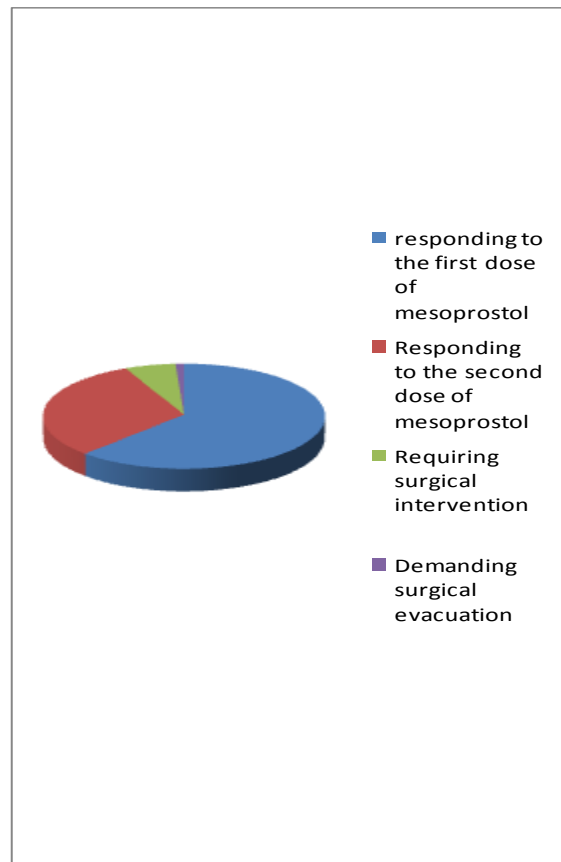


Figure 1: Distribution of cases by outcome

Table 1: Relation between age groups and response to the treatment

Age groups	No. and % of those responding to one dose	No. and % of those responding to two doses	No. and % of those treated surgically	P value
18-25	25(71.4%)	10(28.6%)	0(0.0%)	0.008
26-30	22(66.7%)	8(24.2%)	3(9.1%)	
31-35	14(50%)	12(42.9%)	2(7.1%)	
>35	1(25%)	1(25%)	2(50%)	

Table 2: Side effects of orally administered mesoprostol in number and percentage

Side effects	Number	Percentage
Diarrhea	35	35%
Nausea	34	34%
Abdominal pain	14	14%
Headache	9	9%
Vomiting	8	8%

Discussion

Nearly 20% of all confirmed pregnancies end in a spontaneous abortion³, and this gives an idea about the size of the problem. Information obtained from Statistic Department in Erbil Maternity Teaching Hospital shows that there has been 710 cases of incomplete abortion treated by surgical evacuation in the same period of the current study (October 1st, 2009- March 1st, 2010). In USA it was estimated in 1998 that 100.000 uterine curettages were performed annually for early pregnancy failure.²⁴ The standard management of spontaneous abortion up to 1990s was the universal evacuation of the retained products of conception, and this management had been undertaken for the preceding 60-70 years. An alternative way of management is expectant management i.e. waiting for the process of pregnancy loss to end spontaneously. The success rate for this approach ranges from 25-75% and the time

for complete abortion is unpredictable.^{25, 26} For patients, this method creates uncertainty and anxiety, thus development of a safe and effective technique for management of incomplete abortion becomes a major clinical challenge. The safety and effectiveness of medical treatment of first trimester abortion with mesoprostol has been previously demonstrated in multiple studies. As mesoprostol is a cheap drug, effective and does not require special storage conditions, it is of help in countries with limited health care resources. Different management protocols and doses are valuable to be continuously revised to achieve improved success rate, decrease expenses and not the least to reduce discomfort to patients.^{22, 23} In this study the drug was administered orally, as vaginal route is regarded to be less comfortable by patients in our culture. Results are encouraging as surgical evacuation was needed only in 7% of cases of incomplete abortion, taking in consideration the high number of

incomplete abortion which attended the hospital and needed evacuation at the same period of the study, thus less resources are needed to manage this every days gynecological problem. The second achieved result is that administration of the second dose of mesoprostol can increase the success rate from 62% to 93% without increase in rate of complications. To our knowledge there is a similar study by Coughlin *et al*,²⁷ U.K., which was a prospective study, looked at the effectiveness of 400 µg oral mesoprostol in the management of the women with the first trimester incomplete miscarriage with retained products of conception measuring between 15mm and 50 mm on trans-vaginal ultrasound scan. Successful treatment, defined as an empty uterus on scan after 10 days and absence of vaginal bleeding, was achieved in 77.7% of women. Some women with retained products opted to have further mesoprostol treatment or conservative management instead of surgical evacuation and in total 92.4% of women completed their miscarriage without requiring surgery. The conclusion was; a single dose of 400 µg of oral mesoprostol was an effective treatment for women presenting with an incomplete miscarriage. This is in agreement with our study. Blohm *et al*,²⁸ used a single dose of 400 µg mesoprostol vaginally for treatment of incomplete abortion in the first trimester, the maximum time for definition of success was 14 days and successful outcome was achieved in 88% of cases. The results demonstrate that there is significant difference in mean endometrial thickness when effectiveness of the treatment has to be assessed. The less the endometrial thickness the more effective the treatment and those who have thicker endometrium either needed second dose of mesoprostol or surgical evacuation. Our results show that efficacy decreases with increasing gestational age. This is in agreement with the result of a previous study by Khan *et al*.²⁹ who found that, for gestations of ≤ 49 days, mean rates of complete abortion were 94-96% and for

gestations of 50-56 days, the mean rate of complete abortion was 91%. However in a study by De Jonge *et al*,¹⁵ comparing oral mesoprostol and surgical treatment for incomplete miscarriages, only 3 out of 25 women receiving mesoprostol 400 µg had a successful evacuation. The lower rates of success with mesoprostol in this study may be due to the mean duration of amenorrhea was longer, 80 days(11 weeks+ 3 days) and the decision to proceed with surgical evacuation was made 12 hours after mesoprostol administration. Zieman *et al*,³⁰ showed that 62 patient out of 103 developed diarrhea when 800 µg of mesoprostol was given orally. This incidence is higher in comparison to the same side effect in our study (35 out of 100). Thus a lower dose of mesoprostol can be advocated.

Conclusion

- 1-Mesoprostol is an effective treatment of the first trimester incomplete abortion and the efficacy rate can be increased by giving the second dose a week later when complete abortion is not achieved after the first dose provided that the patient is hemo-dynamically stable, no excessive vaginal bleeding and no sign of infection
- 2-The efficacy of the treatment decreases with increasing gestational age and increasing endometrial thickness or in another way with increasing in the amount of retained product of conception.
- 3-It is a suitable type of treatment in our culture since the vast majority of our patients prefers medical treatment compara-

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