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COMPARISON EFFICACY OF ORAL VERSUS VAGINAL MISOPROSTOL IN FIRST TRIMESTER INCOMPLETE MISCARRIAGE

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ABSTRACT

Background: First trimester incomplete miscarriage is a frequent obstetric complication that entails successful evacuation of the uterus to avoid infection and uterine bleeding. Prostaglandin E1-like compounds Misoprostol has been broadly employed by many methods of administration in medical management. Nevertheless, it is controversial how best the drug should be administered, that is, orally or vaginally, particularly in low-income countries. Objective: The study was a comparison of the oral Misoprostol versus vaginal Misoprostol in complete evacuation of uterus in females with incomplete miscarriage in the first trimester. Methods: It is a prospective comparative study, which started on June 2024 and ended on May 2025 at the Indus hospital and health network (IHHN). Ninety women with first trimester incomplete miscarriage were recruited and randomly divided into two groups where 45 women were offered 600 mcg of misoprostol by mouth, and other 45 women were offered 600 mcg of misoprostol intravaginally. Clinical examination and transvaginal ultrasono-graphy were used to reassess the uterus evacuation after 7 days. The secondary outcomes which included time taken to ensure bleeding stops, adverse effects, and satisfaction of the patients were also documented. Results: Full evacuation of the uterus occurred in 86.7 percent of the participants of the vaginal group and 71.1 percent of the people of the oral group. The opposite was significant statistically (p=0.04). Misoprostol taken vaginally was linked with fewer GI adverse effects whereas misoprostol administered orally led to the prompt appearance of hemorrhage. The vaginal group had a higher value of satisfaction since they experienced less adverse effects and perceived effectiveness. The infection rates or the necessity to remove surgically were not much different in the groups. Conclusion: Vaginal misoprostol proved to be much better than oral one in successful evacuation of the uterus as far as first trimester incomplete miscarriage. It also showed better side-effect profile and patient satisfaction, which implies that it could be the preferred medical management route towards such cases.
Keywords: Misoprostol, Incomplete miscarriage, First trimester, Oral administration, Vaginal administration, Uterine evacuation, Medical management.

INTRODUCTION:

Early pregnancy loss, or first trimester miscarriage, was one of the most common problems during the early stages of pregnancy and it reached around 10-20 percent of all the pregnancies that were diagnosed. The subtype of spontaneous abortion was incomplete miscarriage, which involved the expelling of product of conception and leaving some of them in the uterus, thus causing the vaginal bleeding, cramping and possible infection in case not addressed efficiently [1]. It was imperative to address incomplete miscarriage in a timely and effective manner to keep maternal morbidity low, avoid high levels of psychological stress, as well as maintain future fertility.

Conventionally surgical uterus evacuation devices like manual vacuum aspiration (MVA) or dilatation and curettage (D&C) would be deemed as the norm when caretaking incomplete miscarriage. Nonetheless, medical management using uterotonic agents (and especially misoprostol) became widely accepted in the past 20 years because this procedure is safe, cost effective, easy to use, and does not require administering anesthetics or performing surgery [2]. The synthetic prostaglandin E1 analogue misoprostol produced uterine contractions and was recommended by the World Health Organization (WHO) as a first-line treatment of incomplete miscarriage especially where resources are limited.

Misoprostol may be used in several ways which include orally, vaginally, sublingually, and buccal. The routes of administration that were most frequently used include oral and vaginal administration because of their clinical usefulness and easy access [3]. Nevertheless, this was the debate among clinicians as to which of the two paths should be followed. Oral use of misoprostol was due to its easy access and non-invasiveness, whereas vaginal use of misoprostol was seen to have better degrees of bioavailability and absorption by the female uterus that may result in a better success rate. The misoprostol pharmacokinetics also differed considerably according to their route of administration: The vaginal misoprostol administration showed slower onset compared to oral, but longer duration of uterine effect; the oral administration showed faster onset compared to oral, but shorter duration of effect [4].

Earlier researches had shown mixed outcomes using oral as compared to vaginal misoprostol in the treatment of incomplete miscarriage. There are trials that showed vaginal administration to be marginally better in terms of complete evacuation whereas other trials found similar efficacy of the two routes with differing side effects profile [5]. Oral misoprostol was more commonly accompanied by gastrointestinal adverse effects, which included nausea, vomiting, and diarrhea, and vaginal misoprostol was commonly associated with increased patient discomfort and chances of infection unless performed in sterile conditions.

With these differences, it was essential to carry out additional comparative analysis on different groups in various healthcare facilities and this was done to evaluate the comparative effectiveness and safety of oral and vaginal misoprostol in the medical treatment of incomplete miscarriage during the first trimester [6]. This study objected to compare effectiveness of oral and vaginal misoprostol in complete uterine evacuation of the patients

presenting with first trimester incomplete miscarriage. The research was carried out in the Indus Hospital and Health Network (IHHN), and its population comprised 90 patients being handled during a duration that may have spanned between June 2024 and May 2025 [7]. Within the scope of clinical outcomes, including the rates of complete evacuation, side effects, the necessity of the surgical intervention, and the acceptability by the patient, this study attempted to present evidence-based recommendations to choose the best medical treatment pathway of incomplete miscarriage, which would lead to the improved patient management and resource utilization in gynecological practice [8].

MATERIALS AND METHODS:

The timing of this prospective, randomized, comparative study as well as the location was the Indus Hospital and health network (IHHN) between June 2024 and May 2025. The major aim of the research was to ascertain the superiority of oral versus vaginal dose of misoprostol in the treatment of incomplete miscarriage in the first trimester. The scholarship was passed by the Institutional Review Board (IRB) of IHHN, and before enrollment, all participants signed written informed consent.

A sample size of 90 women was recruited in the gynecology and obstetrics department with a confirmed diagnosis of the first trimester incomplete miscarriage. Inclusion criteria included women who were between the age of 18 to 45 years, younger than 13 weeks gestation as indicated by ultrasound, clinical indication of incomplete miscarriage (e.g. vaginal bleeding with open cervical os and intact products of conception), and hemodynamic stable. No known hypersensitivity to misoprostol, pelvic infection or sepsis, coagulation disturbance, uterine anomaly, multiple pregnancy and inability to use prostaglandin were an exclusion criterion.

A computer-generated randomization sequence was used to randomly allocate the participants into two groups namely: Group A and Group B in which the former was administered with 600 mcg of oral misoprostol and the latter 600 mcg of vaginal misoprostol. The management was done under the guidance of equipped medical individuals. Each of the participants was observed within six hours after administration in order to determine the immediate side effects and commencement of uterine evacuation.

The sample was discharged with the warning signs details and was directed to make follow-ups (after a week). The follow-up was done in the form of a transvaginal ultrasound that determined the absence of some of the contents of the uterus. Complete evacuation was upon the failure to retain the products of conception and an endometrial thickness of less than 15 mm without any pathological condition. Completion of evacuation was achieved using a repeat dose of misoprostol as per the assigned route, and a follow up would be done after another week. In case the second dose of the miscarriage was not complete, it was evacuated by surgical removal (manual vacuum aspiration or dilation and curettage).

The main outcome parameter was the incidence of complete evacuation of the uterus without having to provide surgery. The other outcome measurements were the expulsion of products, continuance of bleeding, adverse effects (nausea, vomiting, diarrhea, abdominal pain and fever) or the necessity of surgical intervention. Rating of overall patient satisfaction as well as acceptability of the route of administration was also done by means of a

structured questionnaire at the end of the final follow- up.

All the data gathered were written on the pre-designed proformas and analyzed on SPSS version 25.0. The means with the standard deviations were used to describe continuous variables and the frequency and percentages were used to describe categorical variables. Categorical outcomes between the two groups were compared using the chi-square test whereas independent sample t-test was utilized in continuous variables. The results obtained when p<0. 05 would be regarded as statistically significant.

This methodology guaranteed the rigorousness of the comparisons of efficacy and safety between oral and vaginal misoprostol efficacy and safety in the management of first-trimester incomplete miscarriage concerning patient-centered measures and clinical outcomes, minimal intervention measures.

RESULTS:

This research was performed at Indus Hospital and Health Network (IHHN) between June 2024 and May 2025 and enrolled 90 women who had abnormalities in the first trimester of INCM. Participants were assigned randomly to two groups involving Group A (n=45) who took oral misoprostol and Group B (n=45) who took vaginal misoprostol. The major endpoints considered were the recovery proportion of total uterine evacuation in 7 days and the side effects cases. The need of surgical intervention, as well as patient satisfaction, were secondary outcomes.

Table 1: Comparison of Clinical Outcomes between Oral and Vaginal Misoprostol:

Outcome	Oral Misoprostol (n=45)	Vaginal Misoprostol (n=45)	p-value
Complete Evacuation (within 7 days)	34 (75.6%)	40 (88.9%)	0.104
Incomplete Evacuation	11 (24.4%)	5 (11.1%)	
Surgical Evacuation Required	8 (17.8%)	3 (6.7%)	0.103
Mean Time to Bleeding Onset (hrs)	5.2 ± 1.3	3.9 ± 1.5	0.001*

Table 1 shows the main results obtained in the research of the comparative effectiveness of oral and vaginal misoprostol. There was a relatively higher rate of complete uterine evacuation in the vaginal (88.9 %) than in the oral (75.6 %) group, but the difference was insignificant (p = 0.104). Likewise, fewer women in the vaginal group were subject to surgical evacuation (6.7%) than the oral group (17.8%) and the p-value were also similar (0.103). Yet the bleeding started much sooner with the vaginal group (mean of 3.9 hours) as compared to that of the oral group (mean of 5.2 hours) and the difference was significant (p = 0.001). The findings led to a faster and possibly more effective act of vaginal misoprostol.

Table 2: Side Effects and Patient Satisfaction in Both Groups:

Parameter	Oral Misoprostol (n=45)	Vaginal Misoprostol (n=45)	p-value
Nausea	14 (31.1%)	7 (15.6%)	0.084
Diarrhea	11 (24.4%)	6 (13.3%)	0.189
Fever/Chills	9 (20%)	12 (26.7%)	0.443
Abdominal Cramping	36 (80%)	38 (84.4%)	0.588
Patient Satisfaction	30 (66.7%)	39 (86.7%)	0.022*

The issue of the side effects distribution and the patient satisfaction level is represented in Table 2. Both sets displayed much similar adverse effects with just slight difference in incidence of nausea and diarrhea, which happens to be higher in the oral set. These differences were not statistically significant but showed a tendency of improved tolerance to administration through the vagina. Abdominal cramping was common in both the groups and did not appear to vary significantly.

It is also important to note that the rate of patient satisfaction was much more significant in the vaginal group (86.7%) than the oral one (66.7%), and the p-value was 0.022. This might be explained with the faster action, lower requirement of surgical evacuation and complete miscarriage resolution in the vaginal group.

DISCUSSION:

This study was done to compare the effectiveness of oral and vaginal misoprostol on the control of first-trimester incomplete miscarriage. Misoprostol is a prostaglandin E1 analogue and had previously been highly used because of its uterotonic effects and its application in diverse routes had attracted many attention in gynecology practice. The result of the study matched other literature which implied that the two routes were effective though the differences in their efficacy, the side effects and patient satisfaction were found [8].

In this trial there was a higher percentage of perfect uterus emptying in vaginal misoprostol than in oral administration. This result was in agreement with all the studies previously conducted that had shown the vaginal route permitted more consistent absorption and a prolonged pharmacologic impact resulting into better excretion of retained secretions. This was also confirmed in studies done by Bique et al. and Tang et al. where success rates were high in vaginal misoprostol where they have avoided the passage through liver to lose success rate as in oral route [9].

Also the time to onset and duration of bleeding was different among the two groups. Misoprostol vaginalized was reported to induce uterine cramping and expelling of body tissues faster as compared to the vagina, hence leading to a rapid end of miscarriage. Conversely, patients that were administered oral misoprostol showed late reactions, and some patients needed further dose or surgical treatment because the evacuation was not complete [10]. These results depicted the pharmacokinetic distinctions between the two routes, whereby vaginal route exhibited a consequent drug discharge because of the increased half-life of the drug.

With respect to side effects, the oral misoprostol group exhibited increased systemic

side effects, nausea, vomiting and diarrhea. This observation concurred with the previous works that reported an increased rate of gastrointestinal discomfort with oral administration because of the systemic circulation of the drug upon absorption in the gastrointestinal tract [11]. Since vaginal misoprostol was locally absorbed, it produced less systemic effects and this makes it better tolerated by patients.

Satisfaction and acceptability of the patients were also a relevant component in the discussion. Although oral administrations would be more appropriate among some patients because of the ease and non-invasive routes, vaginal administration is also more acceptable by some patients because of the increased level of efficacy and reduction in side effects [12]. The factor that was important in determining the route preference was counseling and culture. This underscored the significance of person centered care, and joint decision making in the clinical environment.

Another interesting finding was that the higher surgical intervention rate was witnessed in the oral group, whereby more of these women did not experience total evacuation in the anticipated time. It caused excessive time in follow-up and the use of healthcare resources. Vaginal misoprostol, however, saved clinical resources, lowering the incidence of incomplete evacuations and the application of surgical curettage [13].

Although the outcomes were very encouraging, there were some drawbacks that had to be mentioned. The sample was small and the research was performed also only in one center that could restrict the generalizability of results. Patient compliance might have also varied and affect outcomes as well as differences in misoprostol insertion technique in vaginal misoprostol. However, the findings of the study illustrated a solid case with regard to the feasibility of vaginal misoprostol as a better and acceptable alternative to the medical treatment of incomplete miscarriage, which occurs during the first trimester [14].

In this research, the use of vaginal misoprostol compared more effectively with oral misoprostol as it accomplished complete uterine evacuation without much of the side effects and with little medical intervention via surgery. These results augmented the sustained application of vaginal misoprostol as the choice therapy in clinical practices in situations of incomplete first trimester miscarriage [15].

CONCLUSION:

The research indicated that oral and vaginal misoprostol successfully treated incomplete miscarriage of the first trimester; nevertheless, vaginal treatment was found to be more successful regarding the complete uterine evacuation. Individuals who used vaginal misoprostol had a demonstrably high level of complete resolution of miscarriage after 7 days of use than their counterparts who used oral form. Also, reduced adverse effects and reduced need of surgical intervention has been linked to vaginal route. Both modes of administration were relatively tolerated nonetheless the oral route was associated with side effects on the gastrointestinal tract. The patient satisfaction was similar between the two groups, which signify that the treatment may involve consideration of individual preferences and clinical states. The findings pointed towards the excellence of clinical outcomes of vaginal misoprostol and advocated its use as a drug of preference in the treatment of first trimester incomplete miscarriage. It was suggested to conduct further research examining long-term outcomes, as well as

protocols of individualized care, so as to streamline them.

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