International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Original Research Article

A Study to Compare the Safety And Efficacy of Intravaginal Mifepristone -Misoprostol Combination, with Extra-Amniotic Ethacridine Lactate for Mid Trimester Pregnancy Termination in a Tertiary Care Center of West Bengal

Dr. Debdut Banerjee[1], Dr. Priyankar Kanrar[2], Dr. Barnali Ghosh[3], Dr. Arunima Chaudhuri[4], Dr. Bibekananda Das[5], Dr. Samir Kumar Hazra[6]

[1]MS G&O, Assistant Professor G&O, Burdwan Medical College and Hospital, West Bengal, India.
[2]MS G&O RMO cum Clinical Tutor, G&O BMCH Burdwan Medical College and Hospital, West Bengal, India.
[3]MS G&O, Senior Resident, Kalna Sub Divisional Hospital, Burdwan.
[4]Associate Professor Department of Physiology, Rampurhat Government Medical College and Hospital, West Bengal, India.
[5]Associate Professor, G&O Burdwan Medical College and Hospital, West Bengal, India.
[6]Professor, G&O, Burdwan Medical College and Hospital, West Bengal, India.

Corresponding Author: Dr. Priyankar Kanrar

ABSTRACT

Background: Termination of second trimester pregnancy has been reported to be associated with 3-5 times higher morbidity and mortality risks than termination in 1st trimester. Aims: To compare the safety and efficacy of intravaginal mifepristone -misoprostol combination, with extra-amniotic ethacridine lactate for mid trimester pregnancy termination.

Materials and methods: This study was conducted in Burdwan Medical College in a time span of one year after taking Institutional ethical clearance and informed consent of the subjects.

102 pregnant women who were admitted in the Gynaecology and Obstetrics department for second trimester abortion between 13-20 weeks of gestation were divided into two groups.

Mifepristone with Misoprostol Group and Ethacridine lactate group and drugs were administered accordingly. All patients were monitored clinically with 2 hourly assessments of maternal temperature, pulse, blood pressure and respiratory rate. Occurrences of fever, chest pain, breathing difficulty, vomiting, diarrhea were recorded. After expulsion of the fetus and placenta cervical injury was looked for and check curettage done in incomplete expulsion cases.

Induction abortion interval was decided as the time duration from introduction of drug to the expulsion of products of conception. The induction abortion interval was defined as time from instillation of ethacridine lactate or administration of 1st dose of misoprostol to abortion.

Hemorrhage was defined as an estimated blood loss exceeding 500 mL approx. quantified as fall in Hb >2 gm/dl or a need for blood transfusion. Fever was defined as a temperature of 38 ^{0}C or more occurring 24 hours or more after pregnancy termination

Statistical methods: Data was collected and compiled and software package SPSS version 19 was used for statistical analysis. P value < 0.05* was considered as significant and <0.01** as highly significant.

Results: No significant difference was found between any of the demographic characteristics like age, BMI, parity and gestational age between Group A and Group B. The induction delivery interval was 16.09 hours and 36.53 hours in group A and B respectively, which was statistically significant. When considering only primigravida, the induction-delivery time came out to be 16.35 hours and 42.27 hours in group A and group B respectively. The difference is statistically significant. On the other hand, in

multigravida, induction-delivery time (P= 0.004), group A= 15.93 hours and 28.2 hours. At the end of 48hours, 100% and 78.43% patients delivered in both groups. Induction - delivery time was found to be less in parous than in nulliparous in both the groups. The most common side-effect was found to be abdominal pain. GI side effects were more in group A but the difference was not statistically significant. Only incidence of fever was found to be more in ethacridine lactate group.

Conclusions: We may conclude that mifepristone and misoprostol combination for second trimester termination of pregnancy is preferable to ethacridine and oxytocin combination, because it works faster, has a higher success rate in a shorter period of time, and fewer complications.

Keywords: Medical termination of pregnancy, mifepristone and misoprostol combination, ethacridine lactate.

INTRODUCTION

Termination of pregnancy (TOP) by induced abortion is practiced worldwide. Induced abortion, either elective or therapeutic termination of a viable pregnancy, is one of the most ancient techniques. Termination of second trimester pregnancy has been reported to be associated with 3-5 times higher morbidity and mortality risks than termination in 1st trimester. [1] There is gradual increase in second trimester abortion because of the wide scale introduction of prenatal screening programs detecting women whose pregnancies are complicated by serious fetal abnormalities such as chromosomal aberrations, cardiac defects, neural tube defects, urogenital malformation, skeletal dysplasias. [1] In India, nearly 15 million abortions take place every year and about 15,000 to 20,000 women die of complications arising out of legal abortions every year. [2]

Surgical evacuation of second trimester pregnancies is highly complicated invasive procedure and morbidity is significantly increased, even in skilled hands. This procedure carries risks of lacerations of upper and lowers genital tracts, retained products of conception, hemorrhage and damage of the adjacent organs. The risk of laceration of the cervix has adverse effect on future fertility and at the same time adds morbidity due to anesthesia and hemorrhage. [1-2]

Second trimester termination of pregnancy carried out from 13 to 20 weeks can be physically and psychologically traumatic for the patient. Surgical termination of pregnancy is of high risk for the woman's health and medical ways are required. Important reasons for termination of pregnancy include fetal demise, pregnancy induced hypertension, fetal anomalies, contraception failure where termination of pregnancy has to be performed to safeguard maternal health.

Misoprostol is a synthetic 15-deoxy-16-hydroxy-16-methyl analogue of naturally occurring prostaglandin E1, marketed for use in the prevention and treatment of peptic ulcer disease 6. However, misoprostol is now used for a variety of indications in the practice of Obstetrics and Gynaecology, including medical termination of pregnancy, medical management of miscarriage, induction of labor, cervical ripening before surgical procedures and the treatment of postpartum hemorrhage. The effects of misoprostol are dose dependent. It includes cervical softening and dilation, uterine contractions and common side-effects include nausea, vomiting, diarrhea, fever, and chills. The advantages of misoprostol over other synthetic prostaglandin analogues are its low cost, long shelf life, no need for refrigeration, and worldwide availability. [3]

Misoprostol can be used in combination with mifepristone, or alone in repeated dose schedule for medical termination of pregnancy. Mifepristone, also known as RU-486, is a synthetic, 19-norsteroid, anti-progesterone. In presence of progesterone, mifepristone acts as a competitive progesterone receptor antagonist. Mifepristone cause blockade of progesterone receptors directly causes endometrial decidual degeneration, cervical softening and dilatation, release of endogenous prostaglandins, and an increase

in the sensitivity of the myometrium to contractile effects of prostaglandins. Mifepristone-induced decidual breakdown indirectly leads to trophoblast detachment. Common side effects include abdominal pain, feeling tired and vaginal bleeding. However, in resource poor countries only misoprostol regimens are more readily accepted because of greater availability and affordability. [3]

Ethacridine lactate (EL) acts on the uterus and induces abortion after 1st 3 months of pregnancy, through extra-amniotic instillation at the dosage regimen of 10 ml/ gestational weeks of 0.1 % of EL solution. Its activity is enhanced by alkaline solutions. Hypersensitivity and delayed wound healing on prolonged use are its adverse reactions. [4]

An ideal method for termination of pregnancy should be safe, easy and effective and associated with less complications, morbidity and mortality. Compared with first trimester Medical termination of pregnancy (MTP), second trimester MTP is associated with an increased risk of retained placenta, which leads to a risk of surgical evacuation and/or infection. The present study was conducted to compare the safety and efficacy of intravaginal mifepristone - misoprostol combination, with extra-amniotic ethacridine lactate for mid trimester pregnancy termination.

MATERIALS AND METHODS

This study was conducted in Burdwan Medical College in a time span of one year after taking Institutional ethical clearance and informed consent of the subjects.

Inclusion criteria:

1. Gestational age between 13 to 20 weeks of pregnancy assessed clinically & by sonography
2. Women aged between 18 to 30 years requesting for voluntary termination of pregnancy and satisfying the provisions of MTP Act
3. Willing for medical management
4. Singleton pregnancy

Exclusion criteria:

1. History of intolerance or allergy to misoprostol or mifepristone
2. Any allergy to ethacridine lactate
3. History of any previous CS or any other scar on uterus
4. USG diagnosed low lying placenta
5. Multiple pregnancies
6. Grand multipara
7. H/O any medical complications e.g. cerebral or cardiovascular disease, bronchial asthma
8. Blood pressure above 160/90 mm of Hg,
9. H/O of Diabetes Mellitus
9. Hemoglobin below 10.0 gm/dl
10. Previous uterine bleeding or symptomatic reproduction tract infection
11. H/O Renal disease, hepatic disease, glaucoma

102 pregnant women who were admitted in the Gynaecology and Obstetrics department for second trimester abortion between 13 – 20 weeks of gestation were divided into 2 groups using an online randomizer Group A and Group B.

The subjects in the two groups were age, BMI, parity and gravida matched. Detailed medical and obstetric history was taken, a thorough general, systematic and obstetric examination done. All patients were given antibiotic coverage routinely from day 1 i.e. Cap. Amoxicillin (500 mg) – 1 cap TDS till discharge.

In Mifepristone with Misoprostol Group (A):

The patient was given Tab mifepristone (200 mg) orally on day 1. Then after 48 hours, the patient was administered Tab. misoprostol. She was asked to pass urine, and then after cleaning the vagina, 400µcg of Misoprostol, moistened with 2-3 drops of water, was kept vaginally in posterior fornix. This was followed by 400 µcg of Tab. Misoprostol every four hours, given vaginally till abortion occurred, up to a maximum of 6 doses.

For those without complete expulsion after 24 hours from administration of

misoprostol, confirmed by USG, misoprostol doses were further repeated, oxytocin augmentation done and D/E performed.

In Ethacridine lactate group (Group B):

A Foley's catheter no. 16 was introduced inside the cervix in the extra - amniotic space. 0.1% of ethacridine lactate (EL) in the dosage of 10ml per week of gestation was slowly injected, closing the distal extreme of the probe with a thread in order to prevent the solution from leaking to the exterior. The catheter was kept in-situ and patient was told to be in the ward. The patient was transferred to labour room after 24 hours or earlier if patient had onset of uterine contractions. Intra venous oxytocin drip was given to augment the uterine contractions, if after 72 hours of instillation of EL, there was no pain. If abortion process was incomplete, D & E was performed.

All patients were monitored clinically with 2 hourly assessments of maternal temperature, pulse, blood pressure and respiratory rate. Occurrences of fever, chest pain, breathing difficulty, vomiting, diarrhea were recorded. After expulsion of the fetus and placenta cervical injury was looked for and check curettage done in incomplete expulsion cases.

Completeness of abortion was defined as expulsion of both placenta and fetus without operative assistance.

Definition of failure in the two groups are as follows- product not expelled

i) within 24 hours of first dose of misoprostol

ii) within 72 hrs. of instillation of ethacridine lactate(EL) .

Induction abortion interval was decided as the time duration from introduction of drug to the expulsion of products of conception. The induction abortion interval was defined as time from instillation of ethacridine lactate or administration of 1st dose of misoprostol to abortion.

Hemorrhage was defined as an estimated blood loss exceeding 500 mL approx. quantified as fall in Hb >2 gm/dl or a need for blood transfusion. Fever was defined as a temperature of 38 ^{0}C or more occurring 24 hours or more after pregnancy termination

Data collection techniques and tools: All subjects were admitted to the hospital. Medical-obstetrical history and pelvic examination were recorded. Gestational age was determined primarily by last menstrual period and corroborated with ultrasonography.

Investigations done:

1. USG to determine gestational age
2. Blood grouping and Rh-typing.
3. Blood for Haemoglobin, Haematocrit, Complete blood count,
3. Blood for coagulation profile
4. Blood for urea, creatinine
5. Blood for PPBS
6. Blood for HbsAg, HIV-1 and 2
7. Urine routine and microscopy

Statistical methods: Data was collected and compiled and software package SPSS version 19 was used for statistical analysis. P value <0.05* was considered as significant and <0.01** as highly significant.

RESULTS

In this study we tried to compare the efficacy of different drug regimens administered to two groups of patients i.e. group A (mifepristone+ misoprostol) and group B (Ethacridine Lactate)- their efficacy and safety in 2nd trimester abortion. No significant difference was found between any of the demographic characteristics like age, BMI, parity and gestational age between Group A and Group B. The outcome parameters were studied for Group A and Group B considering all the patients taken together and then as primigravida and multigravida taken separately. The complete abortion rate was 90.19% in group A and 80.39% in group B, where we found no significant difference. Incomplete abortion requiring surgical intervention in the form of dilatation and curettage was 7. 84% in group A and 15.68% in group B. There

was one case of unsuccessful abortion in group A and two such in group B. The induction delivery interval was 16.09 hours and 36.53 hours in group A and B respectively, which was statistically significant (Table1). When considering only primigravida, the induction-delivery time came out to be 16.35 hours and 42.27 hours in group A and group B respectively. The difference is statistically significant (Table2). On the other hand, in multigravida, induction-delivery time (P= 0.004), group A= 15.93 hours and 28.2 hours (Table3). At the end of 48hours, 100% and 78.43% patients delivered in both groups.

Induction - delivery time was found to be less in parous than in nulliparous in both the groups. The most common side-effect was found to be abdominal pain. GI side effects were more in group A but the difference was not statistically significant. Only incidence of fever was found to be more in ethacridine lactate group.

Table 1: Outcome of mifepristone-misoprostol administration (A) vs. ethacridine lactate (B) in 2nd trimester abortion

Parameter	Group A Mean ±SD	Group B Mean ±SD	P value
Induction - Abortion interval(hrs)	16.098±8.003	36.53±18.11	<0.001**

The Induction-abortion interval required was seen to be significantly lower in Group A than Group

P value <0.05* was considered as significant and <0.01** as highly significant.

Table 2: Outcome of induction among primipara

Parameter	Group A	Group B	P value
Induction- abortion interval(hrs)	16.35±9.51	42.27±19.34	0.002**

In primipara induction abortion interval was seen to be significantly lower in mifepristone+ misoprostol group than ethacridine lactate group

P value <0.05* was considered as significant and <0.01** as highly significant.

Table 3: Outcome of induction among multipara

Parameter	Group A	Group B	P value
Induction- interval time	15.935±7.023	28.2±12.41	0.004**

In multipara induction abortion interval was seen to be significantly lower in mifepristone+misoprostol group than ethacridine lactate group

DISCUSSION

This randomized clinical trial was conducted in a time period of 1 year among 102 women attending outpatient department of Burdwan medical College and Hospital. We noted the induction- delivery interval time, number of successful inductions, requirement for surgical intervention, failure rate. The side-effects were noted and compared. a comparative study between the induction- delivery time among primipara and multipara were also done.

In our study the primary outcome was complete abortion which was defined as the expulsion of both the foetus and the placenta without operative intervention. When comparing both the groups i.e. mifepristone with misoprostol vs. ethacridine lactate as a whole in 2nd trimester abortion, we found that both the drugs were effective and there was no significant difference in efficacy between the two drugs. The complete abortion rate was 90.19% in group A and 80.39% in group B. The rates of incomplete abortion were found to be 7.84% in Group A and 15.68% in Group B. The values of our present study are comparable with the study conducted by Deliwala K et al. [2] in Ahmedabad. Deliwala et al found that 7 (14%) had incomplete abortion and required D&E in misoprostol group against 12(28%) in ethacridine lactate group. The success rate was found to be 96% in misoprostol group as compared to 82% in ethacridine group. The proportion of women undergoing D & E due to incomplete abortion was higher with ethacridine group 12(24%) as compared to misoprostol group 7(14%).

Chaudhuri S et al. [5] NRS Medical College, 2006 also concluded from their study that successful abortion resulted in respect to gestational age by the two drugs i.e. intravaginal misoprostol vs extra-

amniotic ethacridine lactate. No significant difference was noted between the two groups. Agarwal S [6] administered 200 micro g of misoprostol every 12 hours and 80.5% women had abortion within 24 hours.

In the study conducted by Nanda S et al. [7] at PGIMS, Rohtak,2012, 96.67% patients (29/30) had successful abortion in Group 1 (Mifepristone+Misoprostol) and 93.33% patients in Group 2 that is, Ethacridine Lactate (28/30). Houa SP et al. [8] in a Chinese trial found that failure rate of abortion was 2.0% to 5.9% in the MM group and 7.4% to 20.7% in the EL group. These findings are similar to our present study.

The secondary outcome measures were induction–abortion interval (time from the placement of the first dose of misoprostol until the time of expulsion of the foetus in group A and time from instillation of Ethacridine lactate extra amniotically to expulsion of products in group B), number of patients having abortions at 24 & 48 hours and comparing between primipara and multipara, number of unsuccessful inductions, need for surgical intervention, incidence of side effects of misoprostol and ethacridine lactate administration.

The induction delivery interval was 16.09 hours and 36.53 hours in group A and B respectively, which was statistically significant. When considering only primigravida, induction - interval time comes out to be 16.35 hours in group A and 42.27 hours in group B and the difference between the two groups is statistically significant. On the other hand, among multipara, induction - interval time was found to be 15.93 hours in group A and 28.2 hours in group B. Studies by Nanda S et.al observed[8], the mean induction abortion interval was 58.31 ± 3.62 and 32.28 ± 9.94 h in Groups 1(time measured from mifepristone administration to expulsion of product) and 2(time from EL to abortion), respectively (p <0.001, VHS) and difference was highly significant. However, misoprostol to abortion interval was found to be significantly shorter that is, 10.51 ± 4.46 h. In the study by Deliwala et al.[2],minimum induction abortion interval in cases of ethacridine lactate was 8 hours and maximum 42 hours while the same for induction by misoprostol were 6 hours and 22 hours. Induction abortion interval was thus found to be less in cases of abortion by misoprostol, statistically significant (p<0.01). The mean induction abortion interval in ethacridine group was 16.24 ± 2.12 hrs while misoprostol group was 9.32±2.16 hrs. This result varies with our present study.

In the study conducted by Chouduri S et al et al. [5] the mean induction abortion interval in women with successful result was 15.5 hours in Misoprostol only regimen Group and 31.3 hours in Ethacridine lactate only regimen Group (P<0.0001)

In prospective study done by Bhattacharjee P et al. [9] with misoprostol in mid trimester MTP mean induction abortion interval was 8.8 hours in 13- 16 weeks gestation and 16.6 hours in 16-20 weeks gestation. Edwards RK et al [10] compared two regimens of vaginal misoprostol, one low dose (200 mcg every 12 hours) and one high dose (400 mcg every 6 hours), for second trimester pregnancy termination at 13 – 27 weeks. They found high dose regimen resulted in more abortions (98% vs 84%; P=0.014) and shorter induction abortion interval (13.25 vs 22.5 hours, P=0.001) without any greater side effects. Sofat R et al [11] reported 92% success rate within 48 hours and 98% within 72 hours following ethacridine lactate instillation for second trimester MTP. The mean induction abortion interval was 31 hours 31 minutes which is comparable with our results. In one large series of second trimester termination of pregnancy by ethacridine lactate, Kamat DS [12] reported an overall success rate of 80-90% within 72 hours and 100% success after reinstillation. However, in their study some women had a pregnancy beyond 20 weeks of gestation. Maru L et al [13] compared intravaginal 200 mcg misoprostol with extra-amniotic ethacridine lactate and

found misoprostol to be safe, cost effective, and having better results (success rate 98% vs 96% and shorter induction abortion interval (12-18 hours vs 36-48 hours).

Expulsion of products within <24 hrs occurred in 94.11%(48/51) in group A and 23.52%(12/51) in group B. At the end of 48hours, 100% patients in group A and 78.43%patients in group B delivered. The numbers of unsuccessful inductions were only 1.96% in group A versus 3.92% in group B. This finding is similar to Smita Nanda S et al. [7] But when computing the number of abortions at the end of 24 hours we found that abortion rates at 24 h being 100% in group A and 78.43% in the group B.

Considering primigravida and multigravida separately,90% of nulliparous women aborted in <24 hrs. in group A whereas only 17.39% delivered in <24 hours in group B. Among the multigravida, 96.7% in group A and 28.57% in group B delivered in < 24 hours. However, all primigravida in group A and 91.3% of primipara in group B delivered in <48 hours. Considering the multipara, 100% in group A and 67.86% in group B aborted in < 48 hours. In studies of Nanda S et al., [7] the induction abortion interval was significantly shorter in parous women than in nulliparous in mifepristone+ misoprostol group (group 1). In Group 1 8/9 (88.88%) delivered within 24 h while 100% (21/21) multigravida delivered within 24 h. However, in Group 2(EL), 12.5% primigravida and 18.18% multigravida delivered within 24 h. Hou SP et al. [14] (2010) also reported that mean induction abortion interval between the two groups was significantly shorter in parous women than in nulliparous women ($p < 0.05$). This correlates with our study. We found that induction interval time was less in parous (i.e. 15.93 hours) than nulliparous women (i.e. 16.35 hours) in group A. Also in group B, the instillation abortion time in parous was found to be 28.2 hours, much less than in nulliparous women where it was found to be 42.27 hours.

In the mifepristone+ misoprostol group, there was 1 unsuccessful induction in Group A (i.e. 1.96%) versus 2(i.e. 3.92%) in group B. For the unsuccessful inductions, we continued with misoprostol administration in group A and patient delivered after 10 doses. We went ahead with dilatation and evacuation/suction and evacuation. In group B, we administered tablet misoprostol (400 microgram) intra vaginally after 48 hours of ethacridine lactate. We then started infusion of oxytocin 20 units in 500ml RL @30 Drops/min till the expulsion of product. None of the patients in either group underwent hysterotomy for termination of pregnancy.

7.84% required surgical intervention in Group A compared to 15.68% in Group B. the requirement for surgical intervention was not significantly different in both group.

The most common side-effect was found to be abdominal pain which was 43.13% in group A and 35.29% in group B. Side effects e.g. nausea, vomiting, abdominal cramps, fever, diarrhoea, haemorrhage were found to more in group A than group B but there was no statistical significance. There was high rise of temperature in 3 out of 51 patients in group A and 4 out of 51 patients in group B. Severe blood loss in the midst of the procedure was experienced by 3 patients in group A and 1 patient in group B. The procedure had to be abandoned and dilation and evacuation was done. These patients' Hb estimation done before discharge and fall in Hb level of > 2 gm/dl was noted. 1 out of the 3 patients in group A required blood transfusion. Overall gastro-intestinal side effects were found to be more in group A. In the study of Nanda S et al [7] the misoprostol cohort experienced fewer complications overall than the ethacridine - oxytocin group (2.1% vs. 20.1% OR 0.086 95% CI 0.03–0.23). The biggest difference was in the number of women who experienced heavy bleeding – three of 189 women with misoprostol versus 30 of 189 women with ethacridine–oxytocin. In

addition, six women in the ethacridine–oxytocin group experienced a febrile syndrome indicative of possible infection compared to none using misoprostol. In the study by Choudhuri S et al., [5] eight women (13.3%) in Group EL had fever as compared to 6 (10%) in Group Mife+miso (P=0.287). Uterine pain necessitating analgesia with 50 mg tramadol hydrochloride occurred in 43 (71.6%) women in misoprostol group and 36 (60%) in Group EL (P=0.090). Nine (15%) women in Group mife+miso had vomiting in comparison to 4 (6.6%) in Group EL(P<0.0001). The blood loss was less than 500 mL in all women. These results are similar to the present study.

CONCLUSIONS

We may conclude that mifepristone and misoprostol combination for second trimester termination of pregnancy is preferable to ethacridine and oxytocin combination, because it works faster, has a higher success rate in a shorter period of time, and fewer complications.

Conflict of interest: Declared none.

REFERENCES

1. Lalitkumar S., Bygdeman M., Gemzell-Danielsson K. Mid-trimester induced abortion:a review. Human Reproduction Update.2007; 13(1),37-52
2. Deliwala K., Shah H., Vyas R.Therapeutic efficacy of misoprostol versus Ethacridine Lactate in second trimester abortion-Randomised controlled Study. National J of Medical Res. 2013;3(1)16-18.
3. Allen R, O'Brien B. Uses of Misoprostol in Obstetrics and Gynecology. Reviews in Obstetrics & Gynecology. 2016;2 (3):159-168.
4. Goldberg AB, Greenberg MB, Darney PD. Misoprostol and pregnancy. N Engl J Med 2001; 344:38-47.
5. Chaudhuri S, Nath MS, Nilanjana N, Debasish C, Banerjee D, Bose S, A comparison of intravaginal misoprostol with extraamniotic ethacridine lactate for second trimester MTP J Obstet Gynecol India. 2006;56 (6) : 518-521.
6. Agarwal S, Chaturvedi B. An experience with misoprostol in second trimester MTP. J Obstet and Gynecol India 2002; 52:52-3.
7. Nanda S, Paul A. Comparison of efficacy and safety of mifepristone-misoprostol combination with ethacridine lactate in mid-trimester termination of pregnancy. International journal of medicine and medical sciences. 2013, 5(6)307-311
8. Houa SP, Fangb AH, Chenb QF, Huangb YM, Chenc O, Chengc LN. Termination of second-trimester pregnancy by mifepristone combined with misoprostol versus intra-amniotic injection of ethacridine lactate (Rivanol®): a systematic review of Chinese trials Contraception. 2011; 84: 214–223.
9. Bhattacharjee P, Muraleedharan PD, Saumandal BK. Role of misoprostol in second trimester abortion – A study report of 40 cases. Abstract Book 48th All India Congress of Obstetrics and Gynecology. Aurangabad. 2004:137.
10. Edwards RK, Sims SM. Outcomes of second-trimester pregnancy terminations with misoprostol: comparing 2 regimens. Am J Obstet Gynecol 2005; 193: 544-8.
11. Sofat R, Jindal P, Gill BK et al. Ethacridine lactate 1% extraamniotic vs intraamniotic for induction of midtrimester abortion. J Obstet Gynecol India 1994; 44:203-5.
12. Kamat DS, Anjaneyulu R. Second trimester termination of pregnancy by ethacridine lactate (A review of 2760 cases). J Obstet Gynecol India 2002; 52:57-61.
13. Maru L, Bansal R. Misoprostol: Changing scenario of 2nd trimester pregnancy termination. Abstract Book 48th All India Congress of Obstetrics and Gynecology. Aurangabad. 2004; 271-2.
14. Hou SP, Fang AH, Chen QF et al: Termination of second-trimester pregnancy by mifepristone combined with a systematic review of Chinese trials. Contraception. 2011; 84(3):214-23.

How to cite this article: Banerjee D, Kanrar P, Ghosh B et.al. A study to compare the safety and efficacy of intravaginal mifepristone -misoprostol combination, with extra-amniotic ethacridine lactate for mid trimester pregnancy termination in a tertiary care center of West Bengal. International Journal of Research and Review. 2018; 5(12):1-8.

******