SCOPE OF EXTRA-OVULAR RIVANOL IN ARTIFICIAL ABORTION AT MIDTRIMESTER

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During the first trimester, artificial abortion can be performed by suction curettage. This method is simple, safe and effective, and there is no better alternative. With the advance of pregnancy, abortion becomes difficult and necessitates initiation of labour contractions. A variety of methods are presently available for inducing uterine contractions, and the recent advancements made in this technology have made midtrimester abortion comparatively simple and effective. However, we are far from perfect in this field. Intraamniotic injection of saline, (1976), injection of prostaglandins by different routes, administration of prostaglandin analogues, intraamniotic instillation of hypertonic urea, and bougie induction are the different methods practised in various parts of our country and varying results have been reported.

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We have employed almost all these methods for our cases. Intraamniotic saline, though effective, is unsuitable for routine use because of the incidence of coagulation failure due to hypernatraemia. Intraamniotic urea has offered several advantages over the Aburel's method, but it is associated with a prolonged induction-abortion interval and a greater failure rate (Rajan, & Nair, 1977). Concomitant oxytocin infusion improves the efficacy of urea but carries the risk of uterine or cervical injury (Rajan *et al.*, 1977). Intraamniotic injection of 15 me Pg F_2 alpha is promising, however, the non-availability, difficulty in storage and the prohibitive cost are the real problems with this product. Prostaglandins are also not absolutely free of the dangerous complications of uterine rupture. The present report concerns our experience with extra-ovular administration of 0.1% rivanol (ethacridine lactate) for midtrimester abortion in 100 subjects. Compared to the other methods, extra-ovular rivanol is more practicable and shows a trend towards greater clinical acceptance.

Materials and Methods

One hundred women requesting for

pregnancy termination in the midtrimester, with the duration of pregnancy ranging from 14 to 20, weeks were selected for this study. Though it was a random selection, those with history of vaginal bleeding and medical disorders were avoided. After completing the preliminary investigations (urine analysis and estimation of haemoglobin) the patient was prepared for the vaginal procedure.

Instillation was performed in the extra-ovular space through a foley's catheter. Two instillations were done at an interval of 4 hours, and the catheter was removed 1 hour after the second dose. Two schedules were followed, and accordingly, in schedule I, only rivanol was instilled and in schedule II, a mixture of rivanol and spartine sulphate (Unitocin) was instilled. The details of the procedure were as follows:

Schedule I: (Rivanol alone). After performing vaginal disinfection the cervix was steadied with a volsellum forceps. The cervical canal was carefully sounded and a sterilised foley's catheter (No. 14 or 16) was passed through the cervical canal into the uterine cavity, between the uterine wall and the foetal membranes. After inserting high up in the uterine cavity the bulb of the catheter was inflated with 10 to 15 ml of saline. The catheter was gradually pulled down till the bulb was tightly wedged in the lower segment to block the internal os. After making sure that there was no bleeding through the catheter 100 ml of 0.1% rivanol was instilled slowly into the extraamniotic space. After the injection was completed, the tip of the catheter was tied with a sterile thread and was left in position to facilitate the second injection. At the end of 4 hours the second dose of 50 ml of 0.1% rivanol was injected and the catheter left in situ for another one hour and then it was removed. Thus the total dose of rivanol was 150 ml and the duration for which the catheter was left in situ was 5 hours.

Schedule II: (Rivanol with sparteine sulphate). The procedure upto the extra-amniotic placement of the catheter was the same. After that rivanol combined with sparteine sulphate (Unitocin) was injected through the catheter. The first dose consisted of 100 ml of 0.1% rivanol and 2 ml (300 mgms) of sparteine sulphate. The second dose after 4 hours was 50 ml of 0.1% rivanol and 1 ml (150 mgms)) of sparteine sulphate. The catheter was removed after one hour of second injection. The total dose of rivanol and sparteine sulphate employed were 150 ml and 450 mgms (3 ml) respectively, and the catheter was left insitu for 5 hours.

The patients were carefully monitored for vital signs and any untoward side effects. The onset, duration and frequency of uterine contractions were recorded. Time interval from the injection of rivanol to expulsion of the foetus was recorded as the induction-abortion time. If the placenta was not expelled within 30 minutes, surgical evacuation was performed. If the patient did not abort within 48 hours, pitocin acceleration was employed with intravenous infusion of 60 to 80 I.U. of syntocinon in 24 hours time. When the patient failed to abort within 5 days it was considered as method failure.

Observations

Midtrimester pregnancy termination was tried with extra-ovular rivanol in 100 randomly selected healthy women. In 50 subjects 150 ml of rivanol was injected and in the other 50 cases 150 ml

of rivanol combined with 3 ml (450 mgms) of sparteine sulphate. This group included 34 nulliparous (unmarried) women and 66 parous women with 2 or more living children. There were no technical failures, such as inability to introduce the catheter, continuous bleeding through the catheter or rupture of membranes.

All the 100 patients aborted within 5 days, giving a success rate of 100%. It was also observed that 72.60% of patients aborted in 48 hours without the help of pitocin acceleration. The mean induction abortion interval was 38 hours and 10 minutes with a range of 8 hours to 120 hours.

Comparative results of the two schedules employed: There was no statistically significant difference in the mean induction time or expulsion rate in the two schedules (Table I). The cumulative abortion rates (Fig. 1) for the two schedules are practically the same. Even, the incidence of incomplete abortion and pitocin acceleration was alike in both schedules. These results suggested that addition of unitocin had no special advantages.

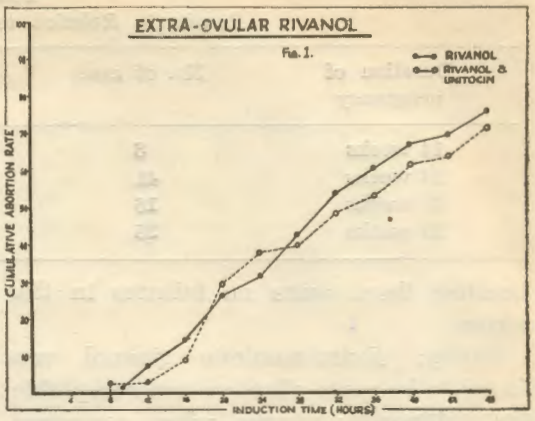

Fig. 1

Duration of Pregnancy: Rivanol was found to be more effective with the advance of pregnancy (Table II). The results were uniformly good for pregnancy duration ranging from 16 weeks to 20 weeks. For early pregnancy cases (14 weeks) the induction time was prolonged (46 hours and 24 minutes) and expulsion rate at 48 hours was only 50.00%; but still the method was effective

TABLE I

Rivanol and Rivanol with Unitocin—Comparative Analysis

Schedule	Mean induction abortion interval	Expulsion in 24 hours	Expulsion in 48 hours	Expulsion in 72 hours	Failure of the method (%)
I (Rivanol) 50 cases	38 hrs. 00 mts.	31.00%	75.40%	91.00%	Nil
II (Rivanol with) Unitocin) 50 cases	38 hrs. 20 mts.	37.00%	70.40%	94.60%	Nil
Total: 100 cases	38 hrs. 10 mts.	34.10%	72.60%	92.40%	Nil

TABLE II
Results in Relation to Duration of Pregnancy

Duration of pregnancy	No. of cases	Mean abortion time	Expulsion in 48 hrs.
14 weeks	8	46 hrs. 24 mts.	50.00%
16 weeks	41	36 hrs. 40 mts.	75.40%
18 weeks	16	43 hrs. 50 mts.	68.75%
20 weeks	35	37 hrs. 00 mts.	74.30%

because there were no failures in this series.

Parity: Extra-amniotic rivanol was found to be more effective and acceptable for nulliparous women when compared to the parous women. (Table III). The mean abortion time was shorter in nulliparous women (31 hours and 50 minutes) and 91.20% aborted in 48 hours without oxytocic acceleration. However, the mean induction time was longer (42 hours 00 minutes) in parous women, and only 65% aborted within 48 hours. Nulliparous women had a low incidence of incomplete abortion (17.60%) than the parous women (31.30%). Even the complications like rise of temperature, rigor and vomiting were less frequent in the nulliparous group.

Complications: Extra-ovular rivanol was totally free of dangerous complications. Blood loss was within normal limits and there was no incidence of uterine sepsis. There was 1 case of cervical tear (posterior lip) which required suturing. Few clinically acceptable side effects which were noticed are mentioned in Table IV.

Discussion

Of the various methods employed for midtrimester pregnancy termination, extra-ovular rivanol shows a trend towards greater clinical acceptance (Table V). Its unique features which deserve a mention are the absolute safety, 100% results and absence of infection. However, this method carries certain disad-

TABLE III
Result in Relation to Parity

Parity	No. of cases	Mean abortion time	Expulsion in 48 hrs.
Nulliparous	34	31 hrs. 50 mts.	91.20%
Parous	66	42 hrs. 00 mts.	65.00%

TABLE IV
Clinically Acceptable Complications

Parity	Pitocin acceleration	Incomplete abortion	Temp.	Rigor	Vomiting
Nulliparous	8.80%	17.60%	35.30%	17.60%	2.90%
Parous	35.00%	36.30%	68.00%	24.20%	4.50%
Total	26.00%	30.00%	53.00%	22.00%	4.00%

TABLE V

Results of Different Methods of Midtrimester Abortion

Method of abortion	Success rate (%)	Expulsion in 48 hours (%)	Major complications (%)	Incomplete abortion (%)
Intra-amniotic Urea	91.20	52.00	Nil	20.20
Intra-amniotic Urea with I.V. Pitocin	96.10	76.90	9.80	20.00
Intra-amniotic Saline	100.00	90.00	8.99	5.61
Intra-amniotic Pg (15 me Pg F_2 alpha)	100.00	100.00	5.00	5.00
Extra-ovular Rivanol	100.00	72.60	1.00	30.00

vantages such as prolonged hospital stay (compared to Prostaglandin and saline), higher incidence of placental retention and pitocin acceleration (Fig. Nos. 2, 3 & 4). Major complications of midtrimester abortion by different methods are shown in Table V, and accordingly the only complication attributable to rivanol is the 1% incidence of cervical injury. (Fig. 5).

Induction of abortion by extra-ovular rivanol has two merits. One is the inherent safety factor of rivanol and the other is the advantages of extra-amniotic injection. Rivanol (ethacridine lactate) is a derivative of acridine, a yellow dyestuff with antiseptic action. In 0.05 to 0.2% solution it has been widely

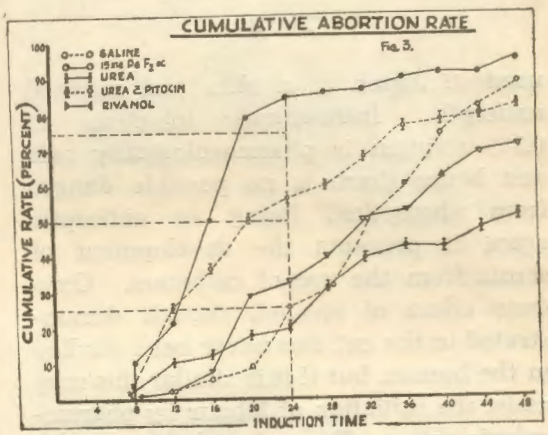

Fig 5

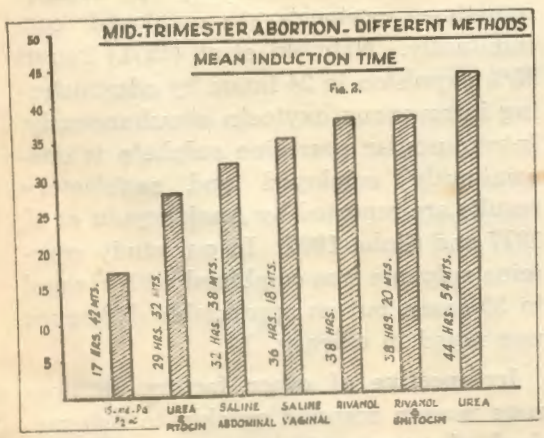

Fig. 2

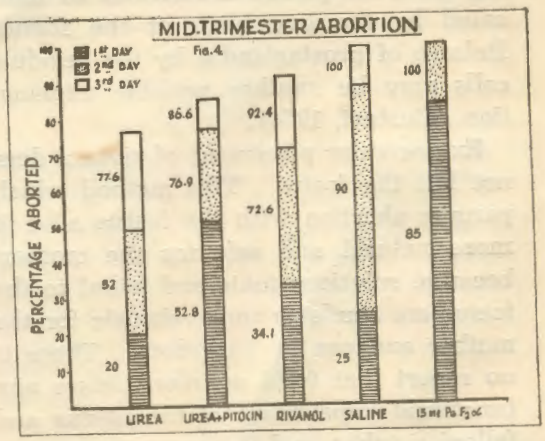

Fig. 4

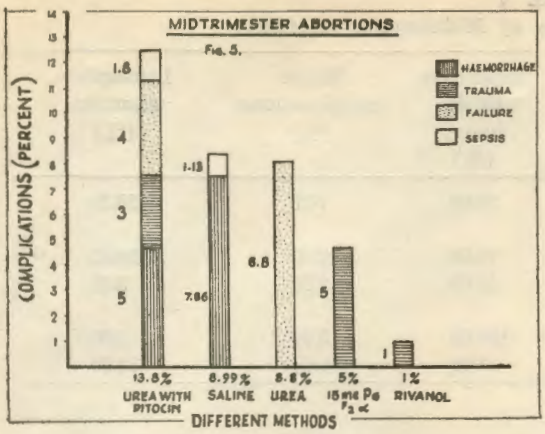

Fig. 3

used in Japan as a skin and mucosal antiseptic. Intravenous injection of 0.1% solution is pharmacologically safe and hence there is no possible danger from absorption. Being an antiseptic agent it prevents the development of sepsis from the use of catheters. Oxytocic effect of rivanol, though demonstrated in the cat, has never been studied in the human, but if it is similar this may assist the initiation of labour by pharmocologic action. Rivanol probably acts by mechanically stimulating the uterine muscles to contract, and not by interfering with the placental function as indicated by the live birth of the foetus. Release of prostaglandin by the decidual cells may be another possible explanation (Gustavi, 1974).

Extra-ovular placement of rivanol does not kill the foetus. This method which permits abortion with the foetus alive is more natural and safe for the mother, because, solutions toxic and lethal to the foetus are similarly unphysiologic for the mother and can be hazardous. There is no report that 0.1% solution causes any functional impairment of the uterus and fallopian tubes, and no reason to suspect it will affect future pregnancies (Manabe, 1969).

The extra-ovular route is far safer and more convenient than the intra-ovular route. The introduction of the catheter is a simple technique and dilatation of cervix is usually not necessary. There is no danger of bladder or intestinal injury and no long-term experience is necessary to insert the catheter. No need for other operative assistants and anaesthesia and the procedure is totally painless. There is no danger of inadvertent intravenous injection and the chance of extravasation from the extra-ovular space is also less common than the intra-ovular injections. The chance of placental damage or rupture of the membranes is inconceivable because the catheter is not as rigid as the bougie.

Although the catheter can be removed after infusion of the solution, it is usually left in the uterus (for 5 hours in the present series). This is because the catheter itself is instrumental in starting labour by its mechanical action on the uterus, as has been seen in the bougie method. Some obstetricians believe that insertion of two catheters is more efficacious than one.

To enhance the efficacy of rivanol sometimes oxytocics are employed concomitantly. Nabriski *et al* (1971) report 95% expulsion in 24 hours by administering intravenous oxytocin simultaneously. Intramuscular sparteine sulphate is concomitantly employed and satisfactory results are reported by Anajaneyulu *et al*, 1977 and Sinha 1977. In our study sparteine sulphate was combined with rivanol in 50 cases, but no appreciable difference was noted in efficacy.

Irrespective of other factors, nulliparous women respond quickly to this method of extra-ovular injection than the

parous women. The complication rate and tendency for placental retention are also less in the former group. Extra-ovular rivanol is effective in terminating pregnancy in the most controversial period of early second trimester (below 16 weeks), and may be preferred over the other methods for this period of gestation.

Conclusion

There are different methods of performing midtrimester abortion. The ideal method must be found by comparision of results, and further improvement of the best available techniques. After having experimented with various methods and solutions, we feel that 0.1% rivanol solution applied extra-ovularly is more acceptable. Many of the advantages of this method are attributable to the physiologic nature of initiation and progress of labour.

Acknowledgement

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