USE OF INTRA-AMNIOTIC AND EXTRA-AMNIOTICALLY ADMINISTERED PROSTAGLANDINS IN ARTIFICIAL INDUCTION OF ABORTION: A COMPARATIVE STUDY

by

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Looking to an unprecedented increase in the number of cases seeking mid-trimester abortions, the progress in evolving a safe and reliable method of inducing abortions has not been very satisfying, if not disappointing. Several abortifacients like hypertonic saline, 50 per cent glucose, mannitol, urea, acridine, formaline and hysterotomy have been tried (Brenner, 1975). Although encouraging results with intra-uterine instillation of prostaglandin in artificial induction of abortions have been reported quite frequently, there is hardly any report dealing with the comparative efficacy and safety of prostaglandins administered by intra-amniotic and extra-amniotic routes. As a step towards this end, we designed our study to compare the success rate, clinical acceptability, safety and efficacy of two prostaglandins ($PGF_{2\alpha}$ and PG-15(S), 15-methyl-$F_{2\alpha}$) in shortening induction abortion interval on intra-uterine administration by intra-amniotic and extra-amniotic routes.

Material and Methods

Seventy-five women seeking medical termination of pregnancy, between 12-20 weeks' gestation, at the State Zenana Hospital, were selected for the present study. The patients selected were healthy with no uterine or extra-uterine associated problem. The choice of the abortifacient used was randomnised so as to make the study strictly comparable.

Instead of multiple doses, we preferred to administer prostaglandins in a single dose, because the latter technique did not require a repuncture or the use of an indwelling catheter. There are other advantages of single dose therapy over the multiple-dose instillation, as in the latter case the transabdominal intra-amniotic catheter or the longer stay of the extra-amniotic catheter increases the chances of infection. The catheter may also get displaced or an early rupture of membranes may occur preventing proper placement of a second dose or the catheter may become knotted, preventing its removal.

Intra-amniotic Administration of $PGF_{2\alpha}$

In 25 women $PGF_{2\alpha}$ (50 mg single dose) was administered by intra-uterine intra-amniotic route. After the patients had evacuated the bladder, abdominal amniocentesis was done under aseptic conditions. An eighteen gauge needle with stylette was introduced at a selected site in the midline, a little above the symphysis pubis. The stylette was withdrawn and, after ensuring a free flow of

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clear liquid, $PGF_{2\alpha}$ (50 mg single dose) was injected slowly to avoid any untoward reaction like bronchospasm and tetanic uterine contractions.

Extra-amniotic Administration of PG-15(S), 15-methyl-$F_{2\alpha}$

This prostaglandin is an analogue of $PGF_{2\alpha}$ and, being 20 to 100 times more potent, requires a lesser dose in extra-amniotic instillation (Wiqvist *et al*, 1974). In 50 women this prostaglandin was administered by intra-uterine extra-amniotic route in a single dose of one mg.

The patient was put in lithotomy position under all aseptic conditions. The posterior wall was retracted by Sim's speculum and the anterior lip of the cervix was held with sponge holding forceps. Nelaton's catheter was passed through the cervical canal beyond the internal os, between the uterine musculature and the amniotic sac. PG-15(S), 15-methyl-$F_{2\alpha}$ (1 mg single dose in viscous Hyskon) was then injected slowly over a period of 5-7 minutes (Wiqvist *et al*, 1974). The catheter was removed immediately after the instillation. The drug was not instilled if there was profuse bleeding and if the back flow of the blood through the catheter did not stop. In all such cases severe flushing of face and profuse sweating were observed soon after the drug instillation.

Results and Discussion

Age and Parity

In the intra-amniotic group, the patients ranged in the age group of 20-40 years, while for the extra-amniotic group the age ranged in between 16-40 years. The parity of the patients ranged in between 1 to 9 for the intra-amniotic group (mean 4.6) while for the extra-amniotic group the parity ranged in between 0 to 7 (mean 3.2). The pregnancies were terminated between 12-20 weeks gestation, the maximum being 16 weeks for both the groups.

Success Rate

In each group, the trial was considered successful if abortion (complete or incomplete) occurred within 48 hours. The intra-amniotic group had a higher success rate (96 per cent) as compared to the extra-amniotic group (82 per cent).

TABLE I
Side Effects in Relation to Method of Induction

Side effects	Intra-amniotic PG		Extra-amniotic PG	
	No.	Per cent	No.	Per cent
GIT				
Nausea	2	8.0	12	24.0
Vomiting	1	4.0	13	26.0
Diarrhoea	—	—	5	10.0
Pyrexia	—	—	1	2.0
Flushing	1	4.0	8	16.0
Perspiration	—	—	8	16.0
Uterine tetany*	1*	4.0	1	2.0
Profuse bleeding	—	—	—	—
Dyspnoea	—	—	2	4.0

* Expired.

In the intra-amniotic group, the only failure observed was the one where the patient died. Anderson *et al* (1972) and Corellete and Ballard (1974) showed 100 per cent success rate with 40 mg single dose of intra-amniotic PG. Our work tallies with Agrawal *et al* (1977), Ganguli *et al* (1977) and Sethi *et al* (1979). Hingorani *et al* (1976) showed 88 per cent success rate with multiple dose therapy.

In the extra-amniotic group there were 9 failed trials, of which 5 were terminated by suction evacuation, 2 cases underwent hysterotomy with sterilization, in 1 case the drug expelled out and therefore the pregnancy was terminated by administering intra-amniotic saline. The remaining 1 case absconded and did not report again. Csapo *et al* (1972 a) showed 100 per cent success rate with single dose of 10 mg $PGF_{2\alpha}$. Wiqvist *et al* (1974) showed 80 per cent success rate with PG-15(S), 15-methyl-$F_{2\alpha}$ in single dose of 750 μg. Our findings are consistent with Hingorani *et al* (1976), Ganguli *et al* (1979) and Sethi *et al* (1979).

Cumulative Abortion Rate

Out of 24 successful cases of the intra-amniotic group, 4.2 per cent aborted in 6 hours, 41.7 per cent in 12 hours, and also the same percentage in 18 hours (making a total of 83.4 per cent). 91.2 per cent of cases aborted within 24 hours and 95.4 per cent in 30 hours. Anderson *et al* (1972) showed 100 per cent result by 48 hours. According to Edelman *et al* (1974) 59.2 per cent of cases aborted with single dose and 73.2 per cent with multiple doses within 24 hours. Brenner (1975) puts the cumulative abortion rate as 69 per cent by 24 hours and 93 per cent by 48 hours using multiple dose therapy. Our study shows that equally effective results could also be obtained with single dose therapy.

Summary

The efficacy of intra-amniotically administered $PGF_{2\alpha}$ (50 mg single dose) in shortening the induction-abortion interval was compared with extra-amniotically instilled PG-15(S), 15-methyl-$F_{2\alpha}$ (1 mg single dose).

The study was done on 75 women seeking artificial induction of abortion at State Zenana Hospitay, attached to S.M.S. Medical College, Jaipur.

In view of the observed high success rate, the complete abortion rate and the cumulative rate in 30 hours, and the lesser induction-abortion interval and the minimal side effects, it was concluded that the intra-amniotic instillation of $PGF_{2\alpha}$ was a superior method for inducing artificial abortion to the extra-amniotic administration of PG-15(S), 15-methyl-$F_{2\alpha}$.

Our study also indicates that the intra-amniotic instillation of PGF_2 is a procedure of choice after 16 weeks of gestation, while the extra-amniotic adminstration of PG-15(S), 15-methyl-$F_{2\alpha}$ is best suited before 16 weeks of gestation. The latter method is useful during the difficult period for the induction of abortion i.e. when the uterus is too large for vacuum aspiration but too small for amniocentasis.

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