

EXTRA-AMNIOTIC INSTILLATION OF UREA-SALINE FOR TERMINATION OF MID-TRIMESTER PREGNANCY

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Though termination of pregnancy has not been accepted as yet as a method of family planning by the Government of India, the offer of "termination of pregnancy" at the time of tubectomy is working as one of the best "incentives" in these cases. In our institution, N.R.S. Medical College Hospital, Calcutta, from April 1976 to September 1976, 1972 tubectomies were performed of which in 625 cases (64.3 per cent) pregnancy was terminated at the same time. As such legal abortion has got great impact in our National Family Planning Programme.

Because of the above reason, there is great need for safe and practical methods of termination of pregnancy. In the first trimester particularly upto 10 weeks of gestation abortion can be performed safely by suction evacuation or dilatation and evacuation. But in the mid-trimester induction of abortion is not all that easy. Each method of termination of mid-trimester pregnancy has got its own defects. With a view to find out a safe, easy and economical method which can be used by our doctors working even in the health centres, the present work was carried out.

Material and Method

One hundred cases were selected at random as per MTP Act for termination of pregnancy between 12th to 20th week and were admitted in the N.R.S. Medical College Hospital, Calcutta.

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After admission the patients were examined clinically to note the state of pregnancy and general health with particular attention to cardiovascular, respiratory and renal condition. The blood pressure was recorded and urine was examined. There was no case with heart disease or renal failure or chronic hypertension in this series.

Perineum was shaved and cleaned with antiseptic solution. Patients were given light meal in the morning and an injection of triflupromazine (Siquil) 20 mg. I.M. half an hour before instillation.

In the operation theatre after putting the patient in the lithotomy position vulvo-perineal parts were cleaned with 2% centrimide in water and covered with sterile dressings. Sim's speculum was introduced and the cervix was caught with Allis' forceps lightly and touched with Tc. iodine. A Foley catheter of No. 14 size was introduced for about 2 inches, the bulb was distended with 20 ml. sterile water and pulled down to fit in snugly over the cervical canal. 150-200 ml. of sterile urea saline solution in plain water containing 20% urea and 5% saline prepared by ourselves was introduced through the catheter slowly by means of a 50 ml. syringe taking about 5 minutes time. Crystalline penicillin 5 lacs was introduced at the same time through the catheter. The bottle was shaken thoroughly before instillation of solution. The condition of the patient was noted carefully althrough. The catheter was closed by a thread or catgut

and strapped to one of the thighs. Sterile pad was applied and the patient was sent back to the ward. Normal diet was given after instillation. The catheter was removed after about 8 hours.

Syntocinon 5 units was injected subcutaneously every 4 hours starting soon after instillation for 24 hours. If the placenta did not come out within half an hour or there was delay in the process of abortion by more than 4 hours syntocinon drip (10 units in a bottle of 5% dextrose) was started intravenously. After complete evacuation ergometrine 0.5 mg. was given intramuscularly. No more antibiotic was given.

The patients were discharged after about 24 hours unless there was any complication.

Results and Observations

Parity

34 per cent were nulliparous. 10 per cent were 6th or more para. Maximum

previous pregnancies were 11 + 2.

Marital Status

68 per cent were unmarried, 10 per cent were widow or separated from husband and 22 per cent were married carrying legal child.

Success rate

99 out of 100 cases had successful abortion. Repeat instillation of urea-saline of 150-200 ml. was given after 72 hours except one case of unmarried pregnancy who aborted after 101 hours without reinstillation.

Complications

TABLE III
Complications

Complications	Per cent
R.P.C. including retained placenta	20
Pyrexia	4
Pelvic infection	2
Gluteal abscess	1
Nausea	4

Induction abortion interval (I/A)

TABLE I
I/A in Relation to Parity

Parity	No. of cases	Range (hours)	Average (hours)	Failure
0	68	7-101	27.3	1
1	10	16-120	69.6	0
2 or more	22	12-106	35.8	0
All cases:	100	7-120	35.6	1

TABLE II
I/A in Relation to Size of Uterus

Size of uterus (weeks)	No. of cases	Range (hours)	Average (hours)	Failure
12-14	16	14-101	36	1
15-17	18	17-37	27	0
18-20	66	7-120	35	0

Discussion and Conclusion

In the present study 20% urea with 5% saline in sterile plain water was instilled extra-amniotically to terminate pregnancy of 12-20 weeks duration in 100 cases chosen at random.

No definite relationship could be found between induction abortion interval and parity or uterine size.

Results of the comparative study of different methods of mid-trimester abortion have been charted in Table IV and V.

120 hours with an average of 35.6 hours. 46% cases aborted within 24 hours and 84% within 48 hours which is comparable with the I/A interval of hypertonic intra-amniotic saline infusion (26.7 to 39.75 hours) but is more than that of prostaglandins used by different methods (10-18 hours). Brenner (1975) using prostaglandin (PGF_{2a}) intra-amniotically on 750 cases procured abortion in 69% cases within 24 hours and in 93% cases within 48 hours. Chandy and Nair (1976) using bougie had a success rate of 86% with

TABLE IV

Success rate and Induction-abortion interval of different methods of termination of mid-trimester pregnancy

Author	Method	No. of cases	Success rate	I/A interval in hours
Hashizuma (1965)	20-30% saline intra-amniotic	6611	—	36
Gillmer <i>et al</i> (1971)	18% saline intra-amniotic	110	93	39.75
Dass <i>et al</i> (1975)	20% saline intra-amniotic	80	96.3	26.7
Tiwari (1976)	18% saline intra-amniotic	100	96	36.25 (15-72 hrs.)
Brenner (1975)	Prostaglandin PGF _{2a} intra-amniotic	750	93	69% in 24 hrs. 93% in 48 hrs.
Bergstrom (1972)	-do-	108	86	58% in 24 hrs. 86% in 48 hrs.
Weinberg and Shepard (1973)	40% urea intra-amniotic	120	—	51.1
Greenhalf <i>et al</i> (1971)	40% urea intra-amniotic	10	100	59 (24-36 hrs.)
Chandy (1976)	Bougie	100	86	51
Present series (1976)	20% urea in 5% saline extra-amniotic	100	99	35.6 (7-120 hrs.) 46% in 24 hrs. 84% in 48 hrs.

99% success rate is better than that of prostaglandin which varies from 70-93% and is comparable with hypertonic (18-20%) intra-amniotic saline. Repeat instillation was done in 10% cases after 72 hours.

Induction-abortion interval was 7 to

an average I/A interval of 51 hours.

Complications were comparatively less as is shown in Table V. There was no maternal mortality nor any incidence of uterine injury or consumptive coagulopathy or hypernatraemia. There was no postabortal excessive haemorrhage. In

TABLE V
Complications of Different Methods of Termination of Mid-trimester Pregnancy

Authors	Method	No. of cases	Morbi- dity (%)	Pyrexia (%)	Pelvic infec- tion (%)	Exces- sive bleed- ing (%)	R.P.C. (%)	Hyper- natrae- mia (%)	Others
Tietze <i>et al</i> (1973)	20% saline intra-amniotic	14,690	25	11.9	4.7	15.8	16	0.4	3 maternal deaths. Severe coagulopathy.
Dass <i>et al</i> (1975)	20% saline intra-amniotic	80	23.6	12.5	1.2	2.5	8.7	—	Failed amnio- centesis 10%
Tiwari (1976)	18% saline intra-amniotic	100	8	2	—	—	5	1	Failed amnio- centesis 3%
Brenner (1975)	Prostoglandin PGF _{2α} intra- amniotic	750	38.9	6.9	—	9.4	33	—	Vomiting and diarrhoea 93%.
Chandy (1976)	Bougie	100	21	7	—	—	13	—	Cervical tear 1.
Palanichamy (1976)	Abdominal hysterotomy with ligation	108	38.9	14.8	0.9	2.8	—	—	Bladder and bo- wel injury—2.8% Urinary infection 2.8% Peritonitis and ileus—2.8% Wound compli- cations—15.7%.
Present series (1976)	20% urea in 5% saline extra- amniotic	100	27	6	1	—	20	—	

Maternal Mortality

Hypertonic saline = 25 deaths (Wagatsuma, 1965), 1 out of 78 cases (Pathak, 1968), 2 out of 61 cases (Chandy, 1976), 3 out of 600 cases in N.R.S. Medical College, Calcutta.

Abdominal hysterotomy = 0.2%. No mortality is reported in other methods.

fact bleeding was much less than expected in any induced abortion. Bleeding was only 1-4 ounces. Whereas bleeding was severe in 2.6-7.4% cases when hypertonic saline was used. The incidence of retained products (24%) in the present series was, however, higher than that of hypertonic intra-amniotic saline infusion (6-16%).

Pelvic infection occurred in only one case though 6 cases had rise of temperature upto 101°F for 12-24 hours within 24 hours of instillation which might be due to release of prostaglandin from the decidua. No antibiotic was needed in any of those 6 cases.

Drawbacks of alternative methods are much more. The main drawbacks of prostaglandins are (i) they are costly and are not available commercially in Indian market, (ii) they are successful in about 75-93% cases and (iii) they produce gastro-intestinal symptoms like nausea, vomiting and diarrhoea in about 50-90% cases. Incidences of pyrexia, postpartum haemorrhage and retained products are comparable with the present method. But prostaglandins can be used with advantage when pregnancy is of 10 to 12 weeks duration when other methods are not much effective.

Intra-amniotic instillation of hypertonic saline cannot be used properly in pregnancies below 16 weeks as intra-amniotic injection often fails and could not be given in 50% cases in 12-15 weeks pregnancy (Mackenzic, *et al* 1971) and in 18.7% cases in 14-16 weeks pregnancy (Chandy and Nair 1976). But in these cases extra-amniotic instillation of urea-saline was successful in 99% of the cases. The greatest drawback of hypertonic saline (18-20%) instillation is hypernatraemia which occurred in 0.4% cases of Tietze and Lewit (1972) and in 1.3% cases of Hashizuma (1965). Several

maternal deaths have been reported from the use of hypertonic saline. Hashizuma from Japan (1965) reported 13 maternal deaths in 6611 collected cases. Since then several maternal deaths have been reported. In N.R.S. Medical College, Calcutta, there were 3 deaths out of 600 cases. Most of the deaths were due to hypernatraemia, consumption coagulopathy, local injuries, haemorrhage and infection. With proper techniques, many of these deaths could have been prevented.

Intra-amniotic instillation of hypertonic glucose has been discarded due to high rate of infection and maternal death even from gas gangrene. Introduction of bougie has never been favoured by the gynaecologists because of chance of infection and its high failure rate. Intra-amniotic infusion of hypertonic urea is being tried in several centres because of its safety and as yet no maternal death has been reported. Weinberg and Shepard (1973) used it in 120 cases of mid-trimester pregnancy. I/A interval was 51.1 hours which was longer than that of other methods. Complications such as infection, bleeding, retained products were similar to those with hypertonic saline but there was no maternal loss or consumption coagulopathy.

Abdominal hysterotomy as a method of termination of mid-trimester pregnancy has been discouraged in all developed countries because of high morbidity rate (38.9% Palanichamy, 1976) and high incidences of serious complications like haemorrhage, shock, bowel and bladder injuries, infection, wound complications, loss of uterus as hysterectomy has to be performed not rarely because of haemorrhage, and maternal mortality rate of about 0.2%.

Earlier we have tried 20% solution of urea instilled extra-amniotically in 12

cases of mid-trimester pregnancy. In 3 cases, it failed inspite of syntocinon drip and in the others I/A interval was 22 to 188 hours with an average of 83 hours. No re-instillation was tried in those cases.

No clinical trial of extra-amniotic instillation of urea or hypertonic saline have yet been given in a fair number of cases and none have used urea saline before the present study.

Extra-amniotic instillation of hyperosmolar urea-saline distends the uterus. The distention was found to be maximum in 2-3 hours time, thereby the size of the uterus reduced gradually and used to come to the pre-instillation size in about 12 hours. Foetuses were found to be dead at the time of abortion in all the cases except in one case and most of them had haemorrhagic areas in their bodies. On naked eye appearance umbilical cord and placenta looked oedematous in most of the cases.

Induction of abortion by the present method is thought to be due to (1) over-distension of the uterus by the hyperosmolar solution of urea saline, (2) death of the foetus and placenta leading to inhibition of progesterone block as suggested by Bengtsson and Csapo (1962), (3) liberation of prostaglandin from the degenerated decidua as postulated by Gustavii (1974), (4) irritation and pressure of Foley catheter on the cervix and lower part of the body of the uterus initiating reflex contraction aided by syntocinon injections.

Syntocinon was given subcutaneously instead of intravenously to reduce trouble of lying in bed for such a long time and reduce the incidences of thrombophlebitis which is very common after I.V. drip and to mimic syntocinon sparting as happens in initiation of labour.

In the present study 20% urea with 5% saline in water has been used extra-amniotically. 200 ml. of 20% urea contains 40 gms. of urea which is much within the therapeutic dose of the drug used intravenously as osmotic diuretic. As such chance of ureamia is nil, more so because of slower absorption of the solution from the extra-amniotic region (David *et al* 1976). Chances of hypernatraemia has been nullified by the use of 5% saline solution instead of 20% saline and by the use of urea solution at the same time which causes not only excretion of water but also that of sodium and chloride.

The present method of induction of abortion in mid-trimester pregnancy has been found to be safe, effective, devoid of major complications and relatively better than any other method available today. Technically the method is very simple and can be used by doctors without any special training even in the health centres. It has great potentiality for mid-trimester abortion, and would surely help our National Family Planning Programme by reducing the drawbacks of other methods and drawing more patients for ligation with MTP. To improve our results, further elaborate trials of different strengths of urea-saline with laboratory investigations are being carried on in our Institution, the results of which will be published later on.

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