

TERMINATION OF PREGNANCY BY INTRAAMNIOTIC INJECTION OF HYPERTONIC SALINE

by

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The value of induction of labour by intraamniotic injection of hypertonic solution like saline is not an innovation and has been used for many years. Termination of pregnancy by intraamniotic injection of hypertonic saline is now frequently employed in cases from the sixteen weeks of pregnancy until twenty to twenty-two weeks. This technique has prevented many abdominal hysterotomies. This technique originally described by Aburel (1934) has been widely used in Scandinavia to induce mid-trimester abortion. Menon and Deshpande (1966) described the effectiveness of intraamniotic injection of 50 per cent glucose in a series of 56 cases with an average induction delivery interval of 20 hours. Their series included cases of medical termination and cases with intrauterine death of the fetus. Wagner *et al*, (1962) and Gillmer *et al*, (1971) reported successful therapeutic abortion in 102 cases out of 110 patients when the uterine size was bigger than sixteen weeks. Kunder's *et al* (1972) published their experience of intraamniotic injection of 50% glucose or 20% sodium chloride in different types of cases. They preferably used hypertonic glucose in cases where patient had some medical complication like hypertension or heart disease. Injection delivery interval in their series varied from 3

hours to 68 hours (average 23 hours). Smith *et al* (1973) have published a series of terminations of pregnancy by this method as well as with hypertonic urea. They did not notice any significant difference in the induction delivery interval between the two methods, but found that the induction delivery interval was reduced in cases where simultaneous intravenous infusion of 200 units of Syntocinon was started. Ballard and Quilligan (1973) reported that injection abortion interval was reduced from 37.9 hours to 22.1 hours in the group where after instillation of intraamniotic saline, oxytocic infusion was started after 1 to 2 hrs.

Complications like serum electrolyte changes due to absorption of hypertonic saline (Anderson *et al*, 1968) and few deaths (Cameron and Dayan, 1966, Cameron *et al*, 1969) have also been reported.

The present paper describes results from a series of 100 patients in which therapeutic termination of pregnancies was performed by intraamniotic injection of 18 per cent sodium chloride solution.

This method was used in those cases where uterine size varied from sixteen to twenty-two weeks of gestation. This was the method selected in many of the cases as an alternative to abdominal hysterotomy. Any associated medical disorder was excluded before using this technique. The age of patients varied between 15 to 45 years and their gravidity from primigravida to ninth gravida.

After admission into hospital general

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examination was performed. Haemoglobin estimation and blood grouping were done. Intramuscular injection of Pethidine hydrochloride 100 mgs and Promethazine hydrochloride 50 mgs was given half an hour before operation. The bladder was emptied prior to commencing the operation.

This technique was carried out as a ward procedure. Patients were put in the supine position and all aseptic precautions were taken before the injection. In cases where blood or blood mixed liquor appeared the procedure was abandoned and another point of injection was selected, but if blood or blood mixed liquor reappeared the procedure was totally

abandoned in favour of some other method; never more than two injections were attempted. In the present series we did not try to remove the liquor except the amount drained during the reflux. Correct position of the needle was confirmed every time while changing the syringe after injection of 50 mls of solution by testing for the free reflux. Throughout the procedure the general condition of the patient was observed. After the completion of the injection the patients remained in bed till the effect of sedative injection lasted. Afterwards they were allowed to move out of their bed till the onset of uterine contractions. If the uterine contractions were not estab-

TABLE I

Showing Comparative Study of Injection Delivery Interval in Different Series with Intra-amniotic Injection

Nature of intraamniotic injection	No. of patients	No. of patients with successful abortion	Injection delivery interval	Author
200 mls of 18 per cent sodium chloride	110	102	39.75 hrs.	Gillmer et al, (1971)
200 mls of 18 per cent saline plus intravenous 200 units of Oxytocin	50	50	21.5 hrs.	Smith & Newton (1973)
200 mls of 40 per cent of Urea plus intravenous infusion of 200 units Oxytocin	50	45	22.79 hrs.	Smith & Newton (1973)
200 mls of 20 per cent of sodium chloride and 50 units of oxytocin	100	99	37.9 hrs.	Ballard & Quilligan
20 per cent sodium chloride or 50 per cent glucose, always 50 ml more than the liquor aspirated	50	49	33.8 hrs.	Kunders & Hemlatha
200 mls of 18 per cent of sodium chloride	100	96	36.25 hrs.	Present Series

lished within 48 hours of injection an intravenous infusion with one litre of 5 per cent dextrose and 50 units of Syntocinon was started and continued until completion of abortion. When uterine contractions were well established an intramuscular injection of 10 mgs Omnopon was given. Ergometrine 0.5 mgs intramuscular injection was administered after the expulsion of the fetus, this was in the majority of cases followed by spontaneous expulsion of the placenta. In those cases where the placenta was not expelled, an intravenous drip with half a litre of 5 per cent dextrose solution and 25 units of Syntocinon was started. If the placenta was not expelled for another 8 hours, manual removal of the placenta under general anaesthesia was performed. Following completion of abortion patients were kept in hospital for another 24 hours, and then allowed home. Haemoglobin estimation of every patient was performed prior to discharge.

Results

In this series 100 cases are analysed; abortion was successful in 96 patients. Eighty-two patients successfully aborted with the initial injection of 18 per cent sodium chloride, 14 of them had addition of intravenous Syntocinon after 48 hours of initial injection. Out of 96 patients, five had manual removal of placenta.

Injection Delivery Interval

Injection delivery interval of 96 successful abortion cases ranged from 15 to 72 hours, the mean injection abortion interval being 36.25 hours. The cases where the injection delivery interval was more than 48 hours were put on intravenous infusion of 50 units of Syntocinon in one litre of 5 per cent dextrose and addition of this usually completed the process of

abortion in another 8 to 24 hours.

Incomplete Abortion

Out of 96 successful abortion cases, in 88 cases delivery of the fetus was accompanied by the delivery of placenta and membranes. In 3 cases it was expelled after the intravenous infusion of Syntocinon in 4 to 8 hours time. A total of 5, out of 96 successful cases, had manual removal of placenta under general anaesthesia.

Failed Induction

In 3 cases blood mixed liquor and in the fourth one blood was aspirated and the procedure was abandoned in favour of hysterotomy.

Complications and Side Effects

Few side effects were noted in the present series. One patient suffered vasovagal syncope as soon as the injection was started and the procedure was abandoned for 24 hours and the second attempt was successful. A second patient complained of flushing over the face and hot sensation all over the body, but improved as soon as the injection was disrupted. Two patients had pyrexia after the injection and did well with antibiotics.

Discussion

The present study of termination of pregnancy by intraamniotic injection of hypertonic saline is suggestive that it is a safe and effective method of termination of pregnancy in the second trimester. This method has reduced the incidences and mutilation problem later due to abdominal hysterotomies. Gillmer *et al* (1971) have reported a series of 102 successful cases by this method of termination with minimal side effects, the present series also supports this view that

the procedure is safe and with few side effects if carefully carried out. In the present series consisting of 100 patients we found very few side effects, which is quite similar to the previous published series. No one seems to work-out the maximum doses of hypertonic saline to be injected, but in many previous series 200 mls of 18 per cent or 20 per cent sodium chloride solution has been used. Gillmer *et al* (1971) removed 100-200 mls of liquor prior to the injection of hypertonic saline. In the present series no liquor was removed except the amount lost during the reflux, similar technique was practised by Smith and Newton (1973). In the series of Kunder *et al* (1972) and Menon and Deshpande (1966), the authors removed as much liquor as they could and injected 50 ml more of the hypertonic solution than the amount aspirated. Reviewing through the literature 200 mls of 18 per cent and 20 per cent sodium chloride solution seems to be commonly accepted and well tolerated by the patient.

Technique of administration is also very important, multiple attempts should not be made, two attempts are quite sufficient and if blood or blood mixed liquor is obtained the procedure should be abandoned. This technique should be performed in the conscious patient so that any untoward effect can be revealed immediately. Sedation in the present series was used prior to the injection to cut down the apprehension of the patient as well as to potentiate the effect of the local anaesthesia, but still the patient was fully conscious. Cameron and Dayan (1966) reported death in which the technique was practised under general anaesthesia, which is a disadvantage where the side effects cannot be elicited early as compared to a fully conscious

patient. Many workers in this field have advocated simultaneous administration of oxytocic infusion; this was not practised in present series. Wagner *et al* (1962) failed to find a significant diminution of the injection delivery interval by the routine use of oxytocin when contractions did not start in 24 hours. Smith and Newton (1973) reported a shorter injection abortion interval if oxytocin injection was started after 1 to 2 hours of instillation of saline. No opinion can be given about it by the present work as simultaneous infusion of oxytocin was not practised.

Few workers are of the opinion that it is wise to proceed immediately to remove the placenta because of the potential risk of haemorrhage and infection as a consequence of this delay. In fact it is likely that if full 8 hours period is allowed to elapse the number of evacuations are likely to reduce further. In the present work eight or more hours were left for the removal of placenta and five required this operation under anaesthesia.

The use of this intraamniotic injection has many advantages. It may be preferred to hysterotomy avoiding the uterine scar and operative complications. Length of stay in the hospital is less compared to hysterotomy. There is little doubt that provided simple precautions are observed this technique of termination of pregnancy in the second trimester is safe and satisfactory.

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Both these groups have been further correlated to the clinical history relating to the number and nature of abortion and the possible pathological lesions that could be felt by histomorphologic examination.

An attempt has been made to find the cause of amniocentesis and identify on the basis of histological report of each metal carriage and histomorphologic graphic observation. Cytological examination of vaginal smear was carried out in a few cases of secondary amniocentesis.

Results of Analysis

TABLE I

In Relation to Number of Abortions

Group	No. of Cases	No. of Abortions
Group A	11 (50%)	1
Group B	11 (50%)	2
Group C	11 (50%)	3
Group D	11 (50%)	4
Group E	11 (50%)	5
Group F	11 (50%)	6
Group G	11 (50%)	7
Group H	11 (50%)	8
Group I	11 (50%)	9
Group J	11 (50%)	10
Group K	11 (50%)	11
Group L	11 (50%)	12
Group M	11 (50%)	13
Group N	11 (50%)	14
Group O	11 (50%)	15
Group P	11 (50%)	16
Group Q	11 (50%)	17
Group R	11 (50%)	18
Group S	11 (50%)	19
Group T	11 (50%)	20
Group U	11 (50%)	21
Group V	11 (50%)	22
Group W	11 (50%)	23
Group X	11 (50%)	24
Group Y	11 (50%)	25
Group Z	11 (50%)	26

The purpose of analysis of cause of abortion is to identify the factors responsible for these abortions. The exact etiology of the abortions is not always clear. The objective of the present paper is to probe into the possible factors responsible for such abortions. The present study is an attempt to identify the factors leading to secondary amniocentesis.

Material and Methods

The present study has been carried out in all of them, the histomorphologic examination was carried out in the second trimester. Some of these cases had been reported in the literature.

The cases were selected from those attending the gynecological out patient department at W. R. S. Medical College, Calicut during the period from January 1969 to June 1973. Out of 110 cases, 55 (50%) were cases of secondary amniocentesis and 55 (50%) were cases of primary amniocentesis.

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