

INTRA-AMNIOTIC INJECTION OF 20% MANNITOL FOR MEDICAL TERMINATION OF PREGNANCY

by

U. P. PURAM,* M.D., D.G.O.

and

R. ANJANEYULU,** M.D., D.G.O.

Introduction

Since the advent of the M.T.P. Act, the obstetrician is often confronted with a number of pregnancies in the 2nd trimester, where vaginal evacuation is out of the question and abdominal hysterotomy has the disadvantage of leaving a scar on the abdominal as well as on the uterine wall. Such a scar is a great handicap, especially in an unmarried girl.

The procedure of intra-amniotic injection of hypertonic solutions is now well established and widely accepted. The common solutions in use are 20% saline and 50% glucose. Glucose has the disadvantage of a greater incidence of infection and saline is known to produce many side reactions if inadvertently injected in the blood stream. The search for a safer solution initiated the present study in which a comparatively innocuous substance Mannitol 20% has been used.

Material and Methods

Thirty-three patients suitable for M.T.P. were selected from the Gynaecological O.P.D. of the Sassoon General Hospitals, Poona. All patients had a pregnancy of

between 12 to 20 weeks. A complete history was taken and careful general, local and systemic examinations were done. Twenty-four to forty eight hours after admission a long needle was introduced per abdomen under local anaesthesia and as much of liquor amnii as possible was removed. 20% Unimannitol supplied by Unichem Laboratories was instilled. The sealed bottle of mannitol was opened in the theatre just prior to instillation. Once opened, the solution was not reused. Thus, for every patient a fresh sealed bottle was opened. No antibiotics were given either locally or systemically. The response of the patient to this instillation was observed for one week. In those patients where there was no response a second instillation was done on the eighth day. Pitocin drip was given to assist the process of expulsion and evacuation was done whenever considered necessary. Patients who failed to abort even after the second instillation were evacuated either by hysterotomy or by vaginal suction evacuation depending upon the size of the uterus at the end of one week after 2nd instillation.

Observations

1. Age Distribution

Patients of all ages were included in this study. The youngest patient was 14 years and the oldest 40 years.

*Asstt. Professor of Post Partum Programme.

**Professor of Obstetrics and Gynaecology, Department of Obstetrics and Gynaecology, B. J. Medical College, & Sassoon General Hospitals, Poona-1.

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2. Parity

Table I shows the distribution of patients according to the parity. 27% were primiparae since this method was preferred for all unmarried girls.

3. Size of the Uterus

63% of patients had uterus below the size of 16 weeks gestation (Table II).

Amount of Mannitol Instilled

This is shown in Table IV.

The Amount of mannitol that could be instilled had no correlation with the period of gestation but had a very significant relation to the outcome. The procedure was 100% effective when more than 200 ml. were instilled.

TABLE I
Parity

Parity	1	2	3	4	5	6	7
No. of cases	9	2	6	5	5	4	2
Percentage	27%	6%	18%	15%	15%	12%	6%
No. of successful cases	7	1	6	3	3	2	0

TALBE II

Size of the Uterus	No. of cases	Percentage	Successful
Below 16 weeks	21	63%	9
Above 16 weeks	12	36%	10

4. Amount of Liquor Removed

In 27% no liquor could be aspirated. Most of these had uteri less than 16 weeks pregnancy. In the remaining patients the amount of liquor depended on the period of gestation. This is shown in Table III.

TABLE III
Amount of Liquor Removed

Amount of liquor removed	No. of cases	Percent- age	No. of successful cases
None	9	27%	2
50 ml.	8	24%	3
50-100	8	24%	6
101-150	4	12%	3
151-200	3	9%	3
201-250	0	0%	0
250 ml.	1	0%	1
	33	100%	18

TABLE IV

Amount of Mannitol Instilled

Amount of Mannitol instituted in ml.	No. of cases	Percent- age	No. of successful cases
0-50	2	6%	0
51-100	2	6%	0
101-150	4	12%	0
151-200	11	33%	8
201-250	4	12%	4
251-300	3	9%	3
301-350	3	9%	3
350-400	1	3%	1
400	3	9%	3
	33	100%	22

Injection abortion interval after the first injection is shown in Table V.

TABLE V
Injection/Abortion Interval

Time	No. of cases	Percentage
0-25 hours	3	9%
24-48 hours	10	30%
48-96 hours	5	15%
96-240 hours	3	9%
11-15 days	1	3%
	22	66%

It was considered that the injection was successful if the patient aborted spontaneously within 96 hours of injection. In the present study, 18 patients aborted spontaneously giving the success rate of 54%. However, 4 more patients who refused reinsertion had spontaneous abortion within the next 10 days bringing the success rate up to 66%.

Nine of the remaining 11 patients had reinsertion, while the other 22 had evacuation for missed abortion.

Outcome of Second Instillation

Of the 9 patients who had reinsertion 7 developed missed abortion, while two continued with their pregnancies. Six of the patients with missed abortion were later terminated with suction evacuation and the remaining patient was suspected to have a fibroid of the uterus in addition to pregnancy and was terminated by hysterotomy. The other two who had continued with their pregnancies in spite of 2 instillations of mannitol were eventually evacuated by hysterotomy.

Mode of Action

It is rather difficult to enunciate the actual mode of action since none of the changes were constant. In two cases pregnancy continued to grow in spite of 2 instillations and the foetus and placenta removed by hysterotomy failed to show any

gross lesions. In a large number mannitol induced a state of missed abortion instead of actually bringing about expulsion of the products.

On histological examination the foetus did not show any appreciable change but the cord was markedly oedematous. Villi showed endarteritis with hydropic degeneration with fibrinoid deposits in the intervillous spaces.

Decidua showed hydropic degeneration as well as mild inflammation and fibrinoid deposits on the outer surface.

The naked eye appearance of the foetus was quite normal. There was neither gross oedema nor shrivelling up of the oetus.

Discussion

Comparison of our results with the results of other workers using different solutions are shown in Table VI.

Our results compare well with those of Craft and Musa (1971) who reported 50% success using 200 cc of 25% Mannitol in cases with uteri above 16 weeks' size. They also confirm our observation that early foetal death is not a necessary prerequisite for abortion, and that the foetuses when aborted are fresh. In cases that failed to abort after primary instillation, reinsertion of urea or saline was done. Simultaneously, syntocinon drip was given and artificial rupture of membranes was done. They reported an average injection abortion interval of 72 hours. The slightly longer injection abortion interval in our series was presumably due to a great preponderance of uteri below 16 weeks size (63% cases) when the amount of liquor removed was below 100 cc (75% cases) and the amount of mannitol instilled was less than 200 cc (57% cases).

Pugh *et al.*, (1971) who used 80 gms

TABLE VI
Comparative Study

Reference	No. of cases	Sol. used	Preg. in weeks	Liquor removed	Solution instilled	Time in hours	Success	Complications comments
1. Brosset	54	50% Glucose	above 16 wks.	100 cc	600 cc	38 hrs.	91%	1 haemorrhage 1 hysterotomy 1 curettage
2. Gillmer	110	18% saline	above 16 wks.	100-200 cc	200 cc	48 hrs.	92.7%	
3. Pugh et al.	61	80 gms urea	above 16 wks.	100 cc	210 cc	72 hrs.	54%	1 D and C 1 hysterotomy 1 reinsertion
4. Greenhal and Diggory	10	80 gms urea	above 16 wks.	200 cc	210 cc	58 hrs.	90%	routine use of syntocin drip
5. Craft and Musa	12	Mannitol 25%	above 16 wks.	100-200 cc	200 cc	72 hrs.	50%	
6. Present series	33	Mannitol 20%	63% below 16 weeks 37% between 16-20 weeks	0-200 cc	0-400 cc	96 hrs.	56%	2 D and C 3 hysterotomies 9 reinsertion

urea dissolved in 210 cc of 5% dextrose also observed a long induction abortion interval and advocated routine use of syntocinon drip (50 units in a pint) 24 hours after instillation.

Craft and Musa (1971) report no complications at all. In the present series however, 3 patients had retained placenta and 2 had haemorrhage.

Summary

Thirty-three cases of medical termination of pregnancy using intra-amniotic instillation of mannitol 20% are presented.

Factors influencing the final outcome in order of importance are found to be (1) amount of solution instilled, (2) amount of liquor aspirated, (3) size of the uterus i.e. period of gestation. The overall success rate was 56% and injection abortion interval was 96 hours. There were no lethal complications.

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