

## LETHAL COMPLICATIONS OF MID-TRIMESTER ABORTION BY INTRAUTERINE INJECTIONS

by

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In recent years, medical method of induction, by intrauterine injection of various solutions has emerged as the most popular method of midtrimester therapeutic abortion. This technique has practically replaced the more complicated and risk associated hysterotomy. The latter procedure, with its higher rate of mortality and morbidity, has become obsolete and is used only in unusual circumstances. The various mid-trimester abortifacients employed presently are hypertonic saline (Mehta 1974 and Mitra *et al* 1975), hyperosmolar urea (Rajan, 1976), prostaglandins (Mallika and Bhaskar Rao, 1974, Jain and Devi, 1976), prostaglandin analogues (Hingorani *et al* 1976), extraovular rivanol (Anjaneyulu *et al* 1977, Sinha, 1977 and Rajan, 1977) and mannitol (Puram and Anjaneyulu, 1976). Combination of Pg F<sub>2</sub> alpha and urea, administered intra-amniotically, has gained greater clinical acceptance recently (Wellman and Jacobson, 1977).

However, no one procedure for performing midtrimester abortion is absolutely safe and hence ideal. Hypernatraemia, tissue necrosis, disseminated intravascular coagulation leading to haemorrhage, and sepsis and endotoxic shock are the potentially serious problems associated with intrauterine injection of many of these abortifacient agents. Our purpose, in this presentation is to elucidate the various lethal complications encountered and analyse their frequency.

### *Material and Methods*

The report relates to the 533 midtrimester therapeutic abortions performed in our institution during the period from May, 1974 to July, 1977. The various agents employed and the different routes of instillation adopted are detailed in table I. Hyperosmolar urea was used more frequently than any other solution, and rivanol (ethacridine lactate) was the second commonest agent employed. All solutions except rivanol, which was administered extra-ovular, were instilled intra-amniotically. Transabdominal amniocentesis was the preferred mode of amniocentesis, and transcervical route was resorted to when the former method was difficult or failed.

The duration of pregnancy ranged from 14 weeks to 20 weeks (Table II).

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TABLE I  
Different Midtrimester Abortifacients Used

Schedule	Administration	No. of women	%age
Hyperosmolar urea (40%)	Intra-amniotic	300	56.40
Ethacridine Lactate (0.1%)	Extra-amniotic	101	19.00
Hypertonic Saline (20%)	Intra-amniotic	88	16.60
Mannitol (20%)	Intra-amniotic	24	4.20
15 me PG F <sub>2</sub> alpha (2.5 mgm)	Intra-amniotic	20	3.80
Total		533	100.00

TABLE II  
Duration of Pregnant in 533 Cases

Duration of pregnancy	No. of women	Percentage
14 weeks	25	4.70
16 weeks	139	26.00
18 weeks	92	17.30
20 weeks	277	52.00
Total	533	100.00

Of the patients terminated, 50.80% (271 cases) were multiparous and 49.20% (262 cases) were nulliparous women. This group also included 11 subject with high risk pregnancies, where therapeutic abortion was indicated.

At the time of instillation of the agent and for 2 hours after the procedure, the patients were monitored by vital signs. When abortion was imminent they were carefully observed for any untoward complications. The time interval from the instillation of the abortifacient agent to the expulsion of the foetus was recorded as the induction-abortion time. If the placenta was not spontaneously expelled within 30 minutes, it was recorded as incomplete abortion, and surgical evacuation of the uterus was carried out. A routine digital or speculum examination was performed in all cases to rule out any cervical injury.

If abortion was not imminent in 36 to 48 hours, pitocin infusion was started to induce uterine contractions. In some cases, especially where the size of the uterus was less than 16 weeks, a laminaria tent was introduced into the cervical canal before starting the oxytocic infusion. In 105 subjects, to shorten the induction-abortion interval, simultaneous pitocin acceleration was employed following intra-amniotic injection of urea. If the patient failed to abort within 5 days, it was considered as failure and alternative methods such as vaginal evacuation, hysterotomy or reinsertion were considered.

Excessive blood loss was combated with blood transfusion, and the cause for haemorrhage was detected and proper treatment instituted. Uterine perforation with myometrial necrosis was treated with hysterectomy. Cervical injuries were sutured vaginally. Antimicrobial therapy was instituted, only when a real indication existed.

#### Analysis of Complications

Of the 533 women who underwent midtrimester abortion, 22 subjects suffered dangerous complications which included severe haemorrhage, myometrial necrosis, cervical injuries, pelvic abscess and death due to endotoxic shock. This

gives a 4% incidence of serious complications for midtrimester termination employing various abortifacient agents. The clinically acceptable complications of less severe degree, such as method failure and incomplete abortions, were recorded in 124 subjects (23%). However, generalisation of the complication rate is not possible, since the incidence and magnitude of these problems are dictated by various factors, the foremost being the nature of the abortifacient agent. The other factors involved in modifying the results are the duration of pregnancy, parity and associated medical disorders. The incidence and severity of the complications associated with the different intrauterine solutions employed are detailed in tables III and IV.

**Haemorrhage:** Haemorrhage was the commonest type of life threatening com-

plication encountered in this analysis. Blood loss, necessitating massive transfusion, was recorded in 12 patients, giving an incidence of 2.20%. This dreaded problem was more often associated with saline induced abortions (7.86%) than any other method. Haemorrhage was not a problem in rivanol or prostaglandin induced abortions, but was an infrequent complication of urea induced abortions (2%).

**Cervical injury:** This complication may go undetected unless a routine inspection of the cervix is made after the abortion. Cervical trauma was demonstrated in 4 patients (0.74%), and in all these instances, the injury was in the posterior cervical lip. Partial annular detachment (of the bucket handle type) in 2 patients and central vertical tear in 2 patients, were the types of injuries

TABLE III  
*Lethal Complications of Midtrimester Abortions*

Complications	Urea		Saline		Rivanol		Mannitol		PG		All cases	
	No.	%age	No.	%age	No.	%age	No.	%age	No.	%age	No.	%age
Haemorrhage	6	2.00	6	7.86	nil	nil	nil	nil	12	2.20		
Rupture Ut.	2	0.66	nil	nil	nil	nil	1	5.00	3	0.56		
Cx Tear	3	1.00	nil	nil	1	1.00	nil	nil	4	0.74		
Pelvic Abscess	1	0.33	nil	nil	nil	nil	nil	nil	1	0.18		
Death (Endotoxic Shock)	nil	nil	nil	nil	nil	2	8.40	nil	2	0.37		
Total complications	12	4.00	6	7.86	1	1.00	2	8.40	1	5.00	22	4.00

TABLE IV  
*Incidence of Incomplete Abortions and Failures*

Schedule	Incomplete abortions		Failures	
	No. of cases	%age	No. of cases	%age
Urea	60	20.00	17	5.70
Saline	8	9.00	3	3.80
Rivanol	30	30.00	1	1.00
Mannitol	2	8.40	3	12.50
15 me PG F <sub>2</sub> alpha	nil	nil	nil	nil



seen. This traumatic problem was more frequent in nulliparous women, as was the case in 3 patients (75%). None of these patients had excessive blood loss, and all these tears were properly sutured.

**Myometrial necrosis and uterine perforation:** Uterine injuries following amnioinfusion occurred in 3 patients, 2 following urea injection and one following prostaglandin (15 me PG F<sub>2</sub> alpha) injection. This produces extensive myometrial necrosis, intraperitoneal haemorrhage and broad ligament haematoma. All the 3 patients were multiparous women, and were treated with hysterectomy. The uterus showed extensive myometrial necrosis of the anterior wall in the prostaglandin induced cases. Whereas, in the urea induced cases, the foetus had escaped into the peritoneal cavity through the anterior or lateral rent in the lower uterine segment. All the 3 patients made uneventful recovery following hysterectomy. The broad ligament haematoma in 1 of the urea induced patients got infected, and the patient was readmitted after 3 weeks with signs of pelvic abscess. She made a quick re-

covery following drainage of the pus through the vagina.

**Pelvic Abscess:** Pelvic abscess developed in 1 patient, 2 weeks after urea induced abortion. She had expelled the foetus within 48 hours, and the placenta was removed manually after 30 minutes. She was readmitted with high fever and a cystic lower abdominal mass. Pelvic examination confirmed the diagnosis, and pus was drained by a colpotomy incision. Her symptoms subsided and she was discharged after a course of antibiotic therapy.

**Death due to Endotoxic Shock:** Two patients died of endotoxic shock following induction of abortion with mannitol. The shock developed subsequent to the expulsion of the products. One patient in this group, a grand multipara, developed consumptive coagulopathy following disseminated intravascular clotting and was given massive blood transfusion. Both patients went into irreversible shock and died within 48 hours after the expulsion of the products.

**Duration of Pregnancy and Complication Rate:** (Table V) There was a sig-

TABLE V  
Duration of Pregnancy and Complication Rate

Complications	14 weeks		16 weeks		18 weeks		20 weeks	
	No.	%age	No.	%age	No.	%age	No.	%age
Failures	6	24.00	8	5.70	4	4.40	nil	nil
Incomplete abortion	8	32.00	44	31.50	25	28.00	19	6.90
Haemorrhage	nil	nil	2	1.40	2	2.40	8	3.20
Rupture uterus	nil	nil	nil	nil	2	2.40	1	0.40
Cervical tear	nil	nil	nil	nil	1	1.20	3	1.15
Pelvic abscess	nil	nil	nil	nil	1	1.20	nil	nil
Death	nil	nil	nil	nil	nil	nil	2	0.80
Minor complications	14	56.00	52	37.20	29	32.40	19	6.90
Major complications	nil	nil	2	1.40	6	7.20	14	5.55



nificant increase in the incidence of major complications with the advanced duration of gestation. There were no dangerous complications in the 14 weeks group, and this problem was negligible in the 16 weeks group (1.40%). However, these complications were more frequent when pregnancy was terminated after 18 weeks. Minor problems amounting to surgical intervention (failures and incomplete abortions) were more common in earlier period of gestation. More than 50% of the patients in the 14 weeks group required a surgical procedure to empty the uterus and this problem was significantly minimal (6.90%) when pregnancy was terminated at 20 weeks.

*Complication Rate as Related to Parity:* (Table VI). While all the 3 uterine per-

suma (1965), reviewing the Japanese literature, has reported a significantly high incidence of haemorrhage associated with saline abortions. Recently, the coagulation disorders associated with hypernatraemia have been incriminated as one of the causes of excessive blood loss. The nature of clotting disorder may be in the form of consumptive coagulopathy (Beller, *et al*, 1972) or disseminated intravascular coagulation (Stander *et al*, 1971).

Eventhough the potentiality for coagulation defects cannot be ruled out (Burnett *et al*, 1975), haemorrhage is an infrequent complication of urea induced abortions. Freedom from the potential hazards of intrauterine infection with dextrose and the untoward complications

TABLE VI  
Complications in Relation to Parity

Parity	Haemorrhage		Rupture Ut.		Cx. Tear		Sepsis		Death	
	No.	%age	No.	%age	No.	%age	No.	%age	No.	%age
Nulliparous 262 cases (49.20%)	10	4.00	nil	nil	3	1.20	1	0.40	1	0.40
Multiparous 271 cases (50.80%)	2	0.80	3	1.10	1	0.40	nil	nil	1	0.40

forations were in multiparous women, 75% of the cervical injuries have occurred in nulliparous women. Haemorrhage, as a dangerous problem, was witnessed more often in nulliparous women. This may be probably because, saline induction was attempted only in nulliparous women.

#### Discussion

Our experience suggests that hypertonic saline cannot be advocated for mid-trimester termination, in view of the high incidence of haemorrhage. Wagat-

of hypernatraemia are the other safety factors which have led to the greater clinical acceptance of hyperosmolar urea in midtrimester abortions. However, like any other abortifacient agent, urea also produces myometrial necrosis and cervical trauma (Parmley *et al*, 1976 and Wellman and Jacobson, 1976). Eventhough uterine rupture is an infrequent complication, the magnitude of the problem makes one think twice before employing urea for grandmultiparous women. The cervical ruptures are mainly due to genital hypoplasia (Kajanoja, *et al*, 1974)



and cervical dystocia (Willems, 1974) and are more common in young nulliparous women.

Extraovular placement of ethacridine lactate (0.1%), advocated by Manabe (1969), has been the safest method of midtrimester abortion, as demonstrated in this study. The only complication associated with this method was a cervical tear in one nulliparous woman. There was an incidence of 1% failure rate, and the main problem with rivanol was the high rate of placental retention (30%).

Prostaglandin analogue, 15 me PG F<sub>2</sub> alpha, administered intra-amniotically was found to be the most efficient abortifacient agent. Minor complications were in the form of nausea, vomiting and diarrhoea and there was one major complication in the form of uterine rupture. The traumatic complications of prostaglandins have been reported to range from 1.25% (Kajanoja, *et al*, 1974) to 3.3% (Duenhoelter and Grant, 1975). To reduce the complications of intraamniotic prostaglandin, a smaller dose of PG F<sub>2</sub> alpha was combined with 80 grams of urea and instilled (Wellman and Jacobson, 1976). There was one cervical injury in the 115 patients studied.

#### Conclusion

No one procedure for performing midtrimester therapeutic abortion is absolutely safe. There is a significant incidence of lethal complications associated with many of these methods. The midtrimester abortion problem will continue to exist for the foreseeable future, until an agent, easy to administer (preferably, self administered), completely safe and with proved effectiveness, comes into existence.

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