

AMNIOINFUSION IN INTRAUTERINE GROWTH RETARDATION AND OLIGOHYDRAMNIOS

MINI SOOD ● NEERA AGARWAL ● KULDEEP JAIN

SUMMARY

Oligohydramnios in cases of intrauterine growth retardation (IUGR) makes sonographic diagnosis of congenital malformations difficult. A preliminary study was conducted in 20 patients where infusion of 100 ml of normal saline was performed under ultrasound guidance, and its effect on sonovisibility as well as the perinatal outcome was studied.

Thirty-nine infusions were done in 20 patients, of which 17 had severe IUGR and 3 had premature rupture of membranes. Sonovisibility improved in all the patients. In the cases with premature rupture of membranes, the liquor drained out immediately despite repeat infusions, and the pregnancies were terminated. The biophysical score improved significantly in all the patients and with repeat infusions the pregnancy was prolonged for an average of 28.8 days. Birth asphyxia occurred in 7 babies of which 5 died in the nursery. Preterm labour or fever did not occur in any of the patients.

INTRODUCTION

Intrauterine growth retardation (IUGR) may be associated with oligohydramnios, which makes sonographic diagnosis of congenital malformations difficult because of the poor visibility of the

fetus and increased fetal flexion. The etiology of oligohydramnios cannot be determined, and assessment of renal function of the fetus is impossible. In Gembruch & Hansman 1983 described a technique of amnioinfusion to overcome these difficulties, and to observe fetal behaviour including urodynamics. A preliminary study was carried out in 20

*Dept. of Obst. & Gyn. Guru Teg Bahadur Hospital,
Delhi.*

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pregnant patients with oligohydramnios. The aim was to study the effect of infusion of normal saline on sonovisibility as well as perinatal outcome.

PATIENTS AND METHODS

Twenty patients admitted in the obstetric ward of the department at the University College of Medical Sciences and Guru Teg Bahadur Hospital were included in the study. Of these 11 had severe idiopathic IUGR, 6 had pregnancy induced hypertension (PIH) with IUGR, and 3 had premature rupture of membranes (PROM). A preinfusion scan was done in all the patients and those cases were selected where the amniotic fluid index was less than five.

100 ml of normal saline at room temperature was infused by transabdominal amniocentesis with a 22 gauge disposable spinal needle under ultrasound guidance. An antibiotic cover with intravenous cefazolin (1G 12 hourly) and tocolysis with oral isoxuprine (10 mg 6 hourly) for 48 hours was given to all the patients. Postinfusion ultrasound was done two hours after the infusion and every week till the patient delivered. Repeat infusions were required in all patients of IUGR. At delivery maternal

as well as perinatal outcome were recorded.

RESULTS

Sonovisibility : A total of 39 infusions were done in 20 patients. The average maternal age was 25.6 years and 5 patients were primigravidas.

The ultrasound visibility improved in all the patients. The absence of congenital anomalies was correctly documented in 18 patients. Of the remaining two patients, in one case suspected anomalies confirmed were renal agenesis and omphalocele and unsuspected anomalies diagnosed were contractures. In the other case the infusion failed. The patient was suspected to have posterior urethral valves. Instead he was found at birth to have imperforate anus (Table I).

Biophysical score : The effect of amnioinfusion on the biophysical score was remarkable (Table II). Fetal movements, liquor pocket, and the nonstress test improved consistently in all the patients, whereas breathing movements improved in some.

Perinatal outcome : The obstetric outcome is shown in Table III. In patients with idiopathic IUGR, oligohydramnios occurred at around 33 weeks and pregnancy was prolonged beyond 37 weeks.

Table I

Sonographic visibility

	Suspected anomaly confirmed	Unsuspected anomaly diagnosed	Unsuspected anomaly undiagnosed
Case 1	Renal agenesis, Omphalocele	Contractures	
Case 2			Imperforate anus

Table II
Effect of amnioinfusion on biophysical score

Diagnosis	No	Average Gestation at diagnosis	Pre-infusion BPS	Post-infusion BPS
IUGR	(11)	33 weeks	4	8.5
IUGR + PIH	(6)	29 weeks	4	8

All these patients required repeat infusions. Patients with associated PIH developed oligohydramnios earlier, at 29 weeks. Pregnancy was prolonged for a similar number of days, but was terminated at an average gestation of 34 weeks.

In patients with PROM it was found that all infused fluid drained out immediately, and the pregnancies were terminated within 5 days.

In patients with idiopathic IUGR, only one patient required caesarean section. The average birth weight was 1.8 kg. Severe birth asphyxia occurred in 2 babies, of which 1 died. In the PIH group 4 (67%) had caesarean delivery and the average birth weight was 1.3 kg.

Two patients went into spontaneous labour at 32 weeks of gestation, 12 days after the last infusion, and delivered vaginally. Both had severe birth asphyxia, and one died within 48 hours. The placentae of both were hypermature with multiple infarcts. One patient required caesarean section at 34 weeks for fetal distress. The baby had meconium aspiration and died after 8 days in the nursery. None of the patients had preterm delivery or fever due to the procedure.

DISCUSSION

Oligohydramnios or decreased amniotic fluid poses several problems for the obstetrician both in diagnosis as well as

Table III
Perinatal outcome after amnioinfusion

Diagnosis	Mean days pregnancy prolonged	LSCS	Mean B.W. (Kg)	Birth asphyxia	Perinatal deaths
IUGR (9)*	27.5	1 (11%)	1.8	2 (22%)	1 (3 days)
IUGR + PIH (6)	31.2	4 (68%)	1.3	3 (50%)	2 (2,8 days)
PROM (3)	3.6	0	0.7	3 (100%)	3 (sb)

* Excluding 2 cases with congenital malformations.

in the management of the pregnancy. The causes include anomalies in the Genito Urinary system of the fetus, like urinary outflow obstruction due to posterior urethral valves or absent urine production due to dysplastic kidneys (Harrison et al - 1982). Babies with IUGR have impaired renal function and thus decreased urine production. The end result of this is impairment of ultrasonic visibility as there is lack of an acoustic window and increased fetal flexion, and fetal anatomy cannot be clearly delineated. Long standing oligohydramnios can lead to lung hypoplasia, amniotic bands, contractures and Potter's facies in the fetus.

To overcome these problems, artificial replacement of amniotic fluid has been attempted by several workers (Commentary 1992; Stringer et al 1980). Gembruch and Hansman (1988) used normofundin, and Fisk et al (1991) used normal saline. Harrison et al (1982) reported that lung hypoplasia was prevented if amniotic fluid was replaced before 20 weeks in cases with bladder outlet obstruction in animal models.

In clinical cases of oligohydramnios replacement of amniotic fluid has been found to be always useful for improving sonographic visibility. The furosemide challenge test has also been used but has not been reported to be useful in cases with IUGR Harman (1984). In the present study instillation of normal saline in cases of IUGR proved to very good for improving sonovisibility. Besides, amnioinfusion was also found to significantly improve fetal well-being in terms

of biophysical score and nonstress test.

Gembruch and Hansman (1988) carried out amnioinfusion in only 8 cases of severe IUGR with the aim of ruling out congenital anomalies and have not commented on fetal well-being.

Fisk et al (1992) have used amnioinfusion to prevent the occurrence of fetal lung hypoplasia in pregnancies complicated by oligohydramnios. They reported that restoration of amniotic fluid in such cases did not acutely affect the incidence of breathing movements in the fetus.

Thus, the potential benefit of amnioinfusion on biophysical score in cases of IUGR, reported in the present study, is of great clinical significance. Controlled randomized trials are needed to provide guidelines for the use of this technique in clinical practice. Complications reported include premature rupture of membranes and labour in 12% Gembruch & Hansman (1984). In the present study none of the patients had fever, PROM or preterm labour.

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