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Evaluation of Transabdominal Amnioinfusion in the Antepartum Management of Oligohydramnios Complicating Preterm Pregnancies.

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OBJECTIVES - To assess the role of antepartum amnioinfusion in raising the amniotic fluid index and prolonging the pregnancy, and its effect on perinatal outcome in cases with preterm oligohydramnios. **METHODS -** Seventeen singleton pregnancies from 24 to 34 weeks of gestation with amniotic fluid index of ≤5, were randomly allocated to two groups controls (nine women) and subjects (eight women). Transabdominal amnioinfusion was performed in subjects under ultrasonic guidance and repeated weekly till delivery if oligohydramnios recurred or persisted. Comparison was made with Chi-Square and t-test. **RESULTS -** Amnioinfusion succeeded in five of the eight subjects. A total of eight successful amnioinfusions were performed. The rise in amniotic fluid index of 3.67 cm was significantly higher in the subjects compared to controls ($p<0.01$). The perinatal outcome was generally poor with only five out of 17 babies surviving. There were no maternal complications. **CONCLUSIONS -** Transabdominal amnioinfusion is a safe procedure. It significantly raises the amniotic fluid index. However perinatal outcome remains poor.

Key words : amnioinfusion, oligohydramnios

Introduction

Oligohydramnios poses a challenge for the obstetrician. The etiology could be fetal urinary obstruction, absence of fetal renal function, preterm premature rupture of membranes (PPROM) or growth restriction of the fetus. Whatever the underlying cause, the prognosis remains poor especially if oligohydramnios is severe or noted in second trimester. Physiological fetal growth and fetal lung development require a critical volume of amniotic fluid. Theoretically, the absence or inadequacy of amniotic fluid allows the uterus to exert continuous pressure against the fetus resulting in abnormal fetal growth. The duration and severity of oligohydramnios are important events in predicting the rate of pulmonary hypoplasia and neonatal morbidity[1]. There are no effective ways to treat oligohydramnios other than bed rest and hydration.Transabdominal amnioinfusion has recently come up as an alternative treatment. This study was undertaken to evaluate the role of antepartum transabdominal amnioinfusion in preterm pregnancies complicated by oligohydramnios.

Material and Methods

This randomized control study was undertaken over a period of 10 months from April 2000, after obtaining clearance from the ethical committee of the institution.

Inclusion criteria were singleton pregnancies with oligohydramnios [Amniotic fluid index (AFI) <5] at 24 to 34 weeks of pregnancy. Exclusion criteria were of frank chorioamnionitis, preterm labor and placental abruption.

Seventeen women who consented to participate in the study were randomly allocated to the control group (expectant management) and study group (management by amnioinfusion) by sealed envelope method.

Procedure of amnioinfusion

A preliminary baseline scan was performed. Written informed consent was obtained. Injection ampicillin 1gm. was given intravenously to all the women after test dose. Under sonography control and with aseptic precautions a 20-gauge needle was introduced transabdominally in the amniotic cavity after local infiltration, and 150-350 mL of warmed isotonic saline was infused at a rate of 25-30 mL /min. This was repeated at weekly interval till delivery if oligohydramnios recurred or persisted . One course of steroids 6 mg dexamethasone intranuscutarly 6 hourly for 4 doses was given to all women at the outset. Oral ampicillin 500/mg was given 6 hourly for 7 days to all women with ruptured membranes.

The control group was expectantly managed after a preliminary scan, with plenty of oral fluids and bed rest.

Repeat scans were performed to note the AFI, 48 hours after admission / ammio infusion and weekly thereafter.

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The following outcome parameters were recorded:

1. Amniotic fluid index (AFI) before and after the procedure or admission.
2. Time interval between PPROM and delivery (Latency period).
3. Abnormal fetal heart patterns.
4. Mode of delivery.
5. Perinatal morbidity and mortality.
6. Clinical evidence of postpartum endometritis.

The data collected were tabulated and compared using the SPSS package with student t test and Chi-square tests.

Results

Amnioinfusion succeeded in five women. A total of eight successful amnioinfusions were performed in them (done twice in three women). The baseline AFI, period of gestation, PPROM and birth weights are shown in Table I. These parameters were comparable in the two groups. Table II shows the mean rise in AFI, median latency period of pregnancy, abnormal fetal heart rate patterns, number of stillbirths and neonatal deaths. The mean increase in AFI was significantly higher (p=0.0146) in the successful subjects. None of the babies born alive had pulmonary hypoplasia. Almost all the babies born alive, but for one each in the two groups, needed admission to the neonatal intensive care unit. Respiratory distress and sepsis were the commonest problems. One of the still born babies diagnosed as a case of renal agenesis after amnioinfusion, had skeletal abnormality.

There was one intrauterine death in the study group. The woman was a second gravida with 32 weeks pregnancy with transverse lie and PPROM. Successful amnioinfusion was done but the fetus died in-utero after 48 hours. She underwent cesarean section as attempted version after repeat successful amnioinfusion failed and delivered a 1200 gm dead fetus. There was no evidence of cord hematoma or of placental or cord accident. Three out of the six PPROM cases in the study group and two out of the seven PPROM cases in the control group went into labor within 24 hours of amnioinfusion / admission indicating that the procedure did not increase the risk of preterm labor. Only two of the 17 women were delivered by cesarean section. The second woman needing cesarean section belonged to the control group. She had oligohydramnios due to growth restriction and had intrapartum abnormal fetal heart rate pattern. Overall, only five babies survived one in the successful amnioinfusion group and two each in the control and failed amnioinfusion group. Amnioinfusion helped to diagnose renal agenesis in one case. There were no maternal complications in the form of clinical evidence of endometritis.

Discussion

Transabdominal amnioinfusion to manage second trimester oligohydramnios is a new method. Only few studies are available in the literature. There have been no randomized control trials. Fisk et al[2] carried out therapeutic antenatal transabdominal amnioinfusion in women of oligohydramnios due to various causes over a period of 4½ years. They did 92 antenatal amnioinfusions in 61 pregnant women with a success rate of 95%. They found an increase in the latency period and reduction in pulmonary hypoplasia in the infused group. However they also had a poor perinatal survival with only 12 of the 61 (5.08%) babies going home. 2.2% of their cases were complicated by clinical chorioamnionitis.

Sarno et al[3] evaluated transabdominal amnioinfusion in women with fetal growth restriction and oligohydramnios, and observed reversal of chronic hypoxemia and stabilization of amniotic fluid volume in at least one of the four women studied.

Garzetti et al[4] performed amnioinfusions in PPROM cases only over 1 ½ years They studied 18 cases and 18 controls with mean gestation of 25 weeks and demonstrated a significant prolongation of pregnancy and improvement in the fetal heart rate short term variability in the nonstress test in the amnioinfused group of cases. But they did not comment on the perinatal outcome.

Locatelli et al[5] evaluated amnioinfusion in 36 PPROM cases with mean gestaton of 19.2 weeks over a 7 ½ year period. They found a considerable reduction in pulmonary hypoplasia and neurological sequelae. They observed that the cases in whom amnioinfusion alleviated oligohydramnios had a significantly better perinatal outcome than those with persistent oligohydramnios inspite of amnioinfusion. However they did not have a control group. They used ritodrine tocolysis whenever indicated. They noted five intrauterine deaths in 25 cases with persistent oligohydramnios. They could successfully infuse all the women but only 30% retained the fluid after 48 hours. In our study also only one out of the three successfully infused cases with PPROM, retained the fluid after 48 hours. We encountered one intrauterine death in the study group. Turhan and Atacan[6] performed amnioinfusions in 15 cases with mixed diagnosis with mean gestational age of 29 weeks. They included 14 controls and demonstrated a significant increase in

Table I. Distribution of the Variables in the Three Groups.

	Control Group	Study Group	
	n=9	Successful AI n=5	Failed AI n=3
Baseline AFI (cm)	3.02 ± (1.33)	3.06 ± (1.55)	2.2
Period of gestation (weeks)	28	31.5	28
Birth weight (kg)	1.12	1.5	1.19
PROM (numbers)	7	3	3

AFI = amniotic fluid index AI = amnioinfusion. PROM = premature rupture of membranes

TABLE-II. Outcome Parameters in the Three Groups

	Control Group	Study Group	
	N=9	Successful AI N=5	FAILED AI N=3
Mean increase in AFI over 48 hours in cm.	1.26 ± 1.37[a]	3.67 ± 1.78[a]	0
Latency period of pregnancy in days [Median (Range)]	9 (1-63)	16 (1-35)	3(1-20)
Cesarean section	1	1	0
Abnormal intrapartum fetal heart rate pattern	6	2	1
Number of still births	4 (44%)	2 (40%)	1(33%)
Number of neonatal deaths	3	2	0
Survivors	2 (22.2%)	1 (20%)	2 (66.7%)

[a] p=0.0146 AI = amnioinfusion

amniotic fluid index and latency period. However they found similar perinatal outcome in the two groups.

In our study also we found a significant increase in amniotic fluid index and an apparent increase in latency period of pregnancy in the amnioinfused group. However this did not translate into perinatal benefits. Our hospital being a tertiary care government hospital with over 10,000 deliveries a year has a heavy burden on neonatal intensive care unit. The resulting cross infection and poor purchase power of women for specialized treatment in general, results in high perinatal mortality rates specially in preterm deliveries.

The paucity of cases in the two groups was a shortcoming of our study.

Transabdominal amnioinfusion is a safe procedure. It increases the amniotic fluid index significantly. But this benefit did not translate into perinatal survival benefits in our study. A larger randomized controlled study needs to be done to demonstrate perinatal survival benefits of this procedure before it can be recommended for preterm oligohydramnios especially in our country with very high perinatal mortality, more so in preterm deliveries.

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