

## Polyhydramnios as a Predictor of Adverse Pregnancy Outcomes: A Case Control Study

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### Original Research Article

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**Abstract:** The aims of our study were to assess the perinatal outcomes associated with polyhydramnios and to determine if there is a relationship between degree of polyhydramnios and risk of these adverse outcomes. Material and methods: The material included 50 patients at or beyond 28 weeks of gestation with  $AFI \geq 25$  and 50 others with normal AFI. Among case group 34 diagnosed with mild polyhydramnios, 14 with moderate and 2 with severe polyhydramnios. Perinatal outcome were compared between case and control group. Results: we observed that polyhydramnios cases had higher incidence of low apgar scores, congenital anomalies, NICU admissions and perinatal mortality as compared to controls. Antenatal diagnosis of polyhydramnios should be considered as a warning sign. Prompt neonatal resuscitation should be ready at the time of delivery and done by experts for better perinatal outcome.

**Keywords:** Amniotic fluid, neonatal resuscitation, congenital anomalies.

### INTRODUCTION

Amniotic fluid balance is a consequence of complex interactions between fetal and maternal systems. The integration of fluid flow into and out generally determines the ultimate volume of amniotic fluid. Fetal urination, lung fluid production, swallowing, and membranous absorption contribute to overall fluid balance especially during late gestation. Various disorders and malformations could possibly result with amniotic fluid imbalance, which is generally associated with adverse perinatal outcome.

The diagnosis is made by two-dimensional ultrasound finding of the amniotic fluid index (AFI)  $\geq 25$  cm or the maximal amniotic pocket (MAP)  $> 8$  cm<sup>1</sup>. Increased value of MAP is the only criterion to diagnose polyhydramnios in multiple pregnancies. The increased perinatal morbidity and mortality associated with polyhydramnios are due to both an increase in congenital/genetic anomalies and preterm births. Perinatal mortality used to approach 100% with acute polyhydramnios<sup>2</sup>; however, with aggressive repetitive amniocentesis, survivors have been reported [3-5]. Chronic polyhydramnios tends to have a better prognosis, especially if idiopathic in origin.

### OBJECTIVE

The main aim of our study was to assess if there is any correlation between polyhydramnios and adverse perinatal outcome as compared to normal pregnancies.

### MATERIALS AND METHODS

The present prospective study was conducted in the Department of Obstetrics and Gynaecology at Zenana Hospital, SMS Medical College, and Jaipur on

100 study subjects attending antenatal clinic at or beyond 28 wks of gestation. These 100 cases were recruited on the basis of inclusion and exclusion criteria with written and informed consent. A detailed medical and obstetric history taken. Routine antenatal investigations (CBC, ABORh, PG 2hr, HBsAg, VDRL, Urine) done for each subject. Then AFI for each subject determined using four quadrant techniques in USG. Two groups were made - case group and control group. Pregnant women with  $AFI \geq 25$  were allocated to case group and pregnant women with normal AFI were allocated to control group. Perinatal outcomes for neonates were noted by estimating fetal weight, APGAR scores at one minute and at five minutes, congenital malformations, NICU admission and neonatal deaths.

### STATISTICAL ANALYSIS

Continuous variables were summarised as mean and SD while nominal/categorical variable as percentage unpaired 't' test was used for continuous variables and  $\chi^2$  for nominal / categorical variables. P-

value < 0.05 was taken as significant. Med Calc 122.1.0 version software was used for statistical analysis.

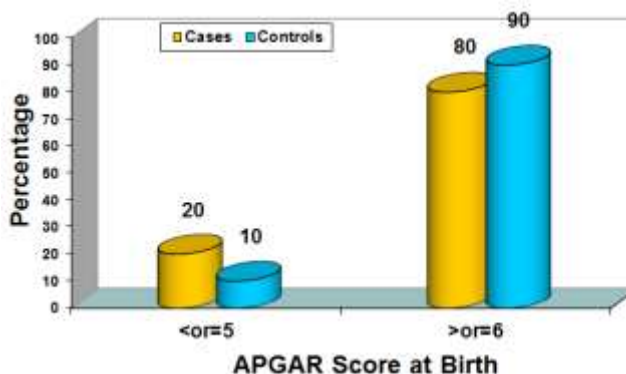
**RESULTS & DISCUSSION**

Both the groups were comparable on the basis of age, religion, residence, literacy status and socio-economic status. Median AFI in case group was 29 with AFI value ranging between 26-36. 34 (68%) patients in case group were having mild polyhydramnios, 14 (28%) patients were having moderate polyhydramnios (AFI = 30-34.9) and 2 (4%) patients were having severe polyhydramnios (AFI ≥35). In control group we

included patients with AFI <25 and median AFI in group was 13 with AFI value ranging between 2-16.

In case group, 44% delivered preterm while in control group 20% delivered preterm. The difference was statistically significant (p-value = 0.037). This signifies that there was increased incidence of preterm labour in polyhydramnios group.

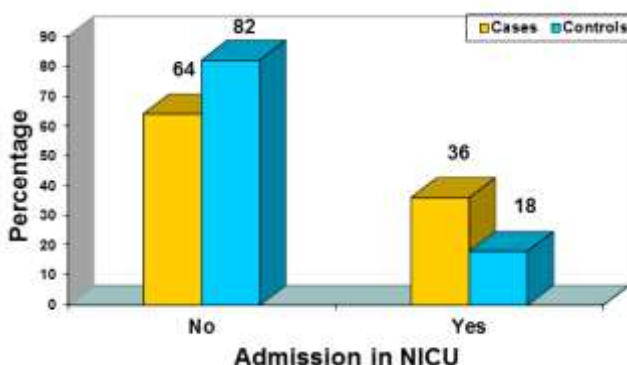
Low APGAR scores at birth seen in 10 (20%) neonates in case group and 5 (10%) neonates in control group. This shows significant relation between polyhydramnios and low Apgar score (p-value = 0.629).



**Fig-1: Distribution According to Apgar score at Birth**

Low APGAR scores associated with polyhydramnios group were both due to an increase in congenital anomalies like TEF, eophageal atresia, TOF etc and preterm births (as preterm babies are more prone to hypoxia and acidosis during labour). Chen KC *et al.* [6] did similar studies regarding perinatal outcome

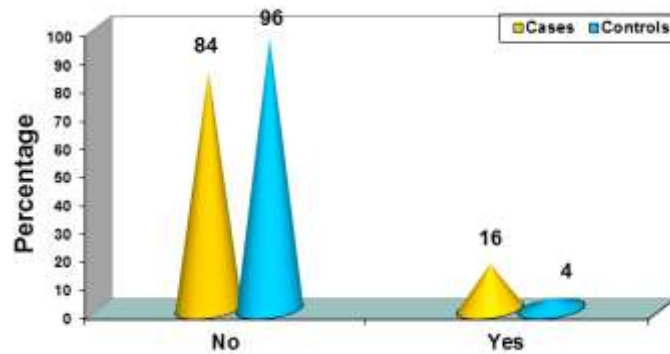
of polyhydramnios after gestational age of 20 wks and found low 1 min and 5 min APGAR scores (p-value < 0.001), which was statistically significant may be because they included a large number of study population in comparison to our study.



**Fig-2: Distribution According to NICU Admissions**

18 (36%) neonates in case group and 9 (18%) neonates in control group were admitted in NICU group. The result was statistically significant and showed definite increased incidence of NICU admission in polyhydramnios. In polyhydramnios group, 1 neonate presented with cleft lip & palate (which was missed on antenatal scans), 2 neonates present with respiratory distress and difficulty in swallowing and later on diagnosed with oesophageal atresia and tracheoesophageal fistula and 1 neonate was admitted 3

days after birth the two respiratory distresses and later on diagnosed with tetralogy of fallot. In 8 cases there was respiratory distress due to prematurity. In 2 elective LSCS cases there was TTN. In 4 neonates of diabetic mothers there were episodes of hypoglycemia causing hypoglycemic seizure. Similar study was done by Khan S *et al.* [7] studying outcome of pregnancy with idiopathic polyhydramnios. They observed increase in number of NICU admission (17.4% v/s 4.9%) in polyhydramnios group compared to control group.



**Fig-3: Distribution According to Neonatal Mortality**

There were 8 (16%) neonatal deaths in case group while 2 (4%) neonatal deaths in control group. In case group, among 8 neonatal deaths, 4 were still birth, all of them were associated with congenital anomaly (anencephaly-1, hydrocephalus-1, omphalocle-1, congenital diaphragmatic hernia-1). Neonate with esophageal atresia expired after 26 hrs of birth. Neonates with tracheo-esophageal fistula survived for 3 hrs. Rest 2 neonates expired due to respiratory distress syndrome. Biggio JR *et al.*[8] conducted a similar study to determine whether hydramnios is associated with adverse perinatal outcomes and found that perinatal mortality rate in all women with hydramnios was 49 per 1000 births, compared with 14 per 1000 births in the control group (p-value < 0.001).

### CONCLUSION

Thus we conclude that polyhydramnios is associated with increased perinatal morbidity and mortality due to increased incidence of preterm deliveries, congenital malformations, low APGAR score and all these leading to higher number of NICU admissions and neonatal deaths.

So antenatal diagnosis of polyhydramnios should be considered as a warning sign both for the sonologist that prompt them to look extremely carefully for fetal malformations and also for the obstetrician to closely monitoring the pregnancy. Proper counselling of patients and attendants should be done related to all the consequences of polyhydramnios. Prompt neonatal resuscitation should be ready at the time of delivery and done by experts for better perinatal outcome

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