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Research Article

Maternal and Fetal Outcomes in Polyhydramnios

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ABSTRACT

Background: Disorders of amniotic fluid volume can predict an underlying foetal or placental pathology. This study was undertaken to evaluate the causes of Polyhydramnios and explain if these volume extremes may be with increased risks for adverse pregnancy outcomes.

Methods: An observational study was done on 100 patients with AFI more than 24 cm or single liquor pocket more than 8 cm with singleton pregnancy after 28 weeks gestation. Maternal Outcomes like the presence of maternal diabetes prenatally detected congenital anomalies, gestational age and mode of delivery and perinatal outcomes like birth weight, Apgar scores and admission to the Neonatal Intensive Care Unit were observed.

Results: The incidence of Idiopathic Polyhydramnios in the study was 57%, 30% of cases had an underlying foetal congenital anomaly, and 13% were associated with maternal gestational diabetes. A higher incidence (77%) of mild Polyhydramnios was observed. The most common congenital anomaly observed involved the Central Nervous System (50%). The overall rate of Caesarean section was high (44%), but the perinatal outcome was favourable, especially in the idiopathic polyhydramnios group with 5.26% of neonates having an Apgar Score less than seven at birth.

Conclusion: In most patients, no underlying cause can be found, but the presence of increased severity of Polyhydramnios should alert the clinician of underlying foetal pathology. Significant perinatal morbidity in Polyhydramnios is attributable to congenital anomalies and prematurity.

Keywords: Congenital anomalies; Gestational diabetes; Idiopathic polyhydramnios; Polyhydramnios

Abbreviations: AFI: Amniotic Fluid Index; DIPSI: Diabetes in Pregnancy Study Group India; NICU: Neonatal Intensive Care Unit; NT NB Scan: Nuchal Translucency, Nasal Bone Scan

INTRODUCTION

Polyhydramnios affects 1%-2% of all pregnancies, but the incidence has been reported to range from as low as 0.2% to as high as 3.9% [1].

On ultrasound, the evaluation of the amount of amniotic fluid can be made subjectively or semi-quantitatively, by estimation of the Maximal Vertical Pocket (MVP), Amniotic Fluid Index (AFI) [2], two-diameter pocket [1] or three-dimensional measurements [3]. Even though ultrasound amniotic fluid volume evaluation is indispensable in the management of high-risk pregnancies, there is no consensus on which ultrasound index is the most accurate in predicting perinatal morbidity and mortality [4]. Polyhydramnios may be acute or chronic. Based on amniotic fluid indices polyhydramnios is classified into Mild (AFI 25-30), Moderate (AFI 30.1-35) and Severe (AFI>35) [5].

Amniotic fluid volume can predict an underlying foetal or placental pathology with abnormalities in fluid production or circulation. The aetiology of polyhydramnios is diverse and involves maternal and foetal conditions. If none of these causes can be identified, then a diagnosis of idiopathic polyhydramnios is made which has an incidence of 50%-60% [1,6,7]. Further research is necessary to identify other as yet undetermined causes.

Many adverse pregnancy outcomes have been reported to be increased with polyhydramnios including caesarean rates, birth weight of more than 4000 gm, increased trisomy rate and perinatal mortality rate [8-12]. This study aims to highlight the intrapartum and postpartum complications associated with polyhydramnios, to assess the perinatal outcomes in these patients.

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METHOD

The study was a prospective observational study conducted in Government Medical College, Jammu, India, over a period of one year. The hospital is a tertiary level referral centre catering to both rural and urban clientele.

All singleton pregnancies with than 28 weeks gestational age with polyhydramnios were included in the study. Polyhydramnios for the study was defined as AFI more than 24 cm or a single liquor pocket more than 8 cm at the time of diagnosis. The booked cases were screened for Down's Syndrome with Dual Marker and NT NB scans if the patient could afford it. For others, only the Level 2 scan was done.

118 women were diagnosed with polyhydramnios out of which 100 women satisfied the above said criteria. These patients were evaluated with detailed history taking, and general, systemic and obstetrical examination was done. After diagnosis, a comprehensive ultrasound examination for the presence of any congenital anomalies was performed. Based on the amniotic fluid index levels, polyhydramnios was classified into Mild (AFI>24 cm-30 cm), Moderate (AFI>30.1 cm-35cm) and Severe (AFI >35cm). Gestational age was established by a reliable last menstrual period or the patient's ultrasound examination.

Every patient without pre-existing diabetes mellitus was evaluated with 2 hours 75 g Oral Glucose Tolerance Test. Diagnosis of gestational diabetes was made according to (DIPSI) guidelines (2-hour value ≥ 140 mg/dl was adopted as the cutoff for labelling patients with Gestational Diabetes). When no underlying cause for polyhydramnios could be identified, the patient was categorised as a case of idiopathic polyhydramnios. Data were analysed using Microsoft Excel and IBM SPSS software.

RESULTS

The majority (59%) of women with polyhydramnios especially with major congenital anomalies belonged to rural areas without anomaly scans done in the antenatal period. The paucity of adequate antenatal services for these women contributed to late detection and eventual fetal morbidity and mortality associated with anomalies. 31% women with polyhydramnios were primigravida, 69% were multigravida. Our results were consistent with the findings in the literature [13], hypothesizing the contribution of advancing maternal age and multiparity to deranged glucose metabolism.

In our study, the maximum number (57%) of patients had Idiopathic polyhydramnios, consistent with findings in the literature [9,11,14]. 30% of patients had foetal congenital anomalies and 13% cases of polyhydramnios were associated with maternal gestational diabetes. None of the cases of maternal diabetes had pre-existing diabetes. Out of 13 women with gestational diabetes, 2 were overt diabetic (DIPSI values above 200 mg/dl). One case of placental angioma was seen, it was associated with non-immune hydrops foetal in the baby. 5% of mothers in our study were Rh-negative, but no case of Rh isoimmunisation or immune hydrops was seen [15].

Most (77%) women had mild polyhydramnios, followed by moderate polyhydramnios (17%), and the least proportion of patients presented with severe polyhydramnios (6%) (Figure 1).

70.59% of cases with moderate polyhydramnios and 5 out of 6 (83.33%) cases with severe polyhydramnios had an associated foetal congenital anomaly, whereas only 16.66% of cases with mild polyhydramnios were associated with foetal anomalies (Table 1). The highest AFI in our study was 50 cm; amniocentesis was done on the patient to relieve her pressure symptoms. 40% of Patients had spontaneous onset of labour. In 49% of patients, induction of labour was done due to maternal and foetal indications. The rest (11%) were delivered by elective Cesarean section due to various obstetrical indications.

The mean gestational age at delivery in our study was 36.63 weeks. In our study, overall, the rate of preterm delivery was 30%, but in foetuses with idiopathic polyhydramnios, the rates of preterm delivery were much lesser, with only 5 out of 57 patients (8.77%) delivering before term (Table 2). The overall rate of vaginal deliveries was more (54%) and the caesarean section rate was 44%, while instrumental deliveries were done in 2% of patients (Table 3). In idiopathic polyhydramnios, however, the rate of caesarean was higher (56.14%), consistent with the findings of Panting-Kemp, et al [16]. 7 out of 13 (53.84%) women with gestational diabetes underwent caesarean delivery. The most common antepartum complication associated with polyhydramnios in our study was premature rupture of membranes (14% cases), out of which 8 were term and 6 were preterm. Malpresentation was seen in 13% of cases, which included 11 cases of breech presentation and 2 cases of a transverse lie.

In the intrapartum period, non-progression of labour, due to uterine inertia, was seen in 3 patients, and cephalopelvic disproportion was

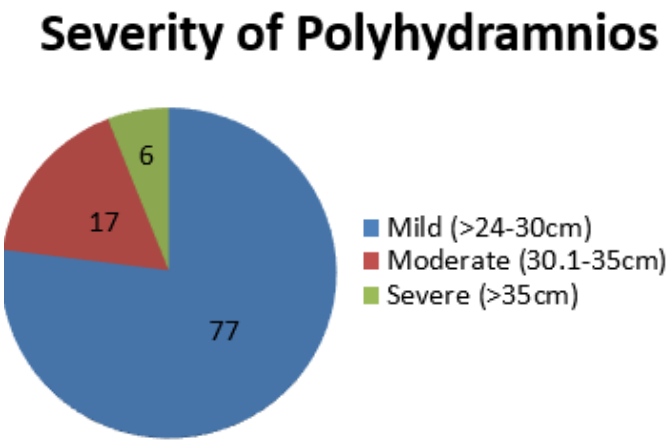

Figure 1: Showing distribution of women with polyhydramnios according to Amniotic Fluid Index.

Table 1: Table showing the distribution of Congenital Anomalies according to the severity of polyhydramnios.

Severity of Polyhydramnios	Total no. of Patients	No. of congenital anomalies	% of patients with congenital anomalies
Mild	77	13	16.66%
Moderate	17	12	70.59%
Severe	6	5	83.33%
TOTAL	**100**	**30**	

Note: Highest incidence of congenital anomalies (83.33%) was associated with severe polyhydramnios, followed by 70.59% incidence in moderate polyhydramnios

Table 2: Table showing the distribution of Gestational Age at Delivery in women with polyhydramnios.

Gestational Age	No. of Patients
28-31 weeks	13
32-36 weeks	17
37-40 weeks	68
>40 weeks	2
TOTAL	**100**
Maximum number of women (68%) delivered at 37-40 weeks of gestation	
Most of the cases of preterm delivery were associated with congenital anomalies. Only 5/57 cases (8.77%) of idiopathic polyhydramnios were delivered preterm	
The mean gestational age at delivery was 36.63 weeks	
Only 2 patients were delivered after due date.	

Table 3: Table showing the distribution of Women with polyhydramnios according to Mode of Delivery.

	Idiopathic	Gestational Diabetes	Congenital Anomaly	Total
Vaginal	24	5	25	54
Cesarean	32	7	5	44
Ventouse	1	-	-	1
Forceps	-	1	-	1
TOTAL	**57**	**13**	**30**	**100**
The overall rate of cesarean was 44%; Elective LSCS in 11 and emergency LSCS in 33 cases				
In idiopathic polyhydramnios, a maximum no. of patients were delivered by cesarean section (n=32/57, 56.14%)				

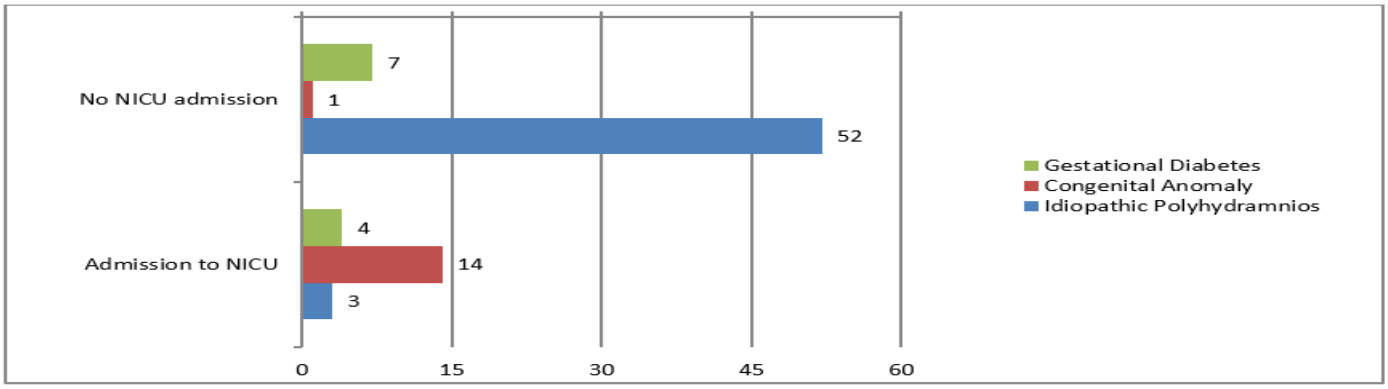

Figure 2: Distribution of neonates according to admission in Neonatal Intensive Care Unit.

Table 4: Perinatal Outcomes in Polyhydramnios.

Perinatal Outcome	No. of Patients
Fetal Congenital Anomaly	30
IUFD	14
Birth Weight ≥ 4kg	9
APGAR score<7 at Birth	17
Admission to NICU	21
Neonatal Jaundice	4

seen in 7 patients. One patient presented with placental abruption and accidental cord prolapse in 2 cases.

In the postpartum period, 5 patients had an atonic postpartum haemorrhage and 2 patients had secondary postpartum haemorrhage owing to subinvolution of the uterus. 1 patient had postpartum sepsis which was managed successfully with conservative treatment.

Table 5: Correlation of AFI with newborn birth weight and APGAR score.

Correlations of AFI with Birth Weight & APGAR Score				
		AFI	Birth weight	APGAR Score
AFI	Pearson Correlation	1	-0.452	-0.39
	Sig.(1-tailed)		<0.001	<0.001
	N	100	100	100
Birth weight	Pearson Correlation	-0.452	1	0.672
	Sig.(1-tailed)	<0.001		<0.001
	N	100	100	100
APGAR Score	Pearson Correlation	-0.39	0.672	1
	Sig.(1-tailed)	<0.001	<0.001	
	N	100	100	100

DISCUSSION

The mean birth weight in our study was 2.76 kg. The incidence

of low birth weight was 19%, very low birth weight was 5%, and extremely low birth weight was 4%. 19 out of 28 (67.85%) cases of low birth weight were associated with foetal anomalies. The incidence of foetal macrosomia, defined as birth weight 4 kg or more was 9%. 4 out of 9 macrosomic foetuses were born to women with diabetes and 5 mothers had idiopathic polyhydramnios (an incidence of 5/57, 8.77%). Smith et al. have suggested that the higher incidence of foetal macrosomia in idiopathic polyhydramnios could be due to subclinical glucose intolerance causing both the polyhydramnios and macrosomia or there may be an increased foetal urine production due to greater foetal size [10].

16% of Babies presented with foetal distress in our study. Our results are comparable to those [17,18] of Taskin et al., who found an incidence of 11.7% in their study. 17 neonates (20%) had APGAR scores <7 at birth and 14% (16.47%) neonates had APGAR scores less than 7 at 5 minutes (Table 4). Most of the babies with low APGAR at birth had co-existent congenital anomalies (Figure 2). The association of low birth weight and low APGAR scores with AFI was found to be statistically significant. The number of babies with low APGAR in idiopathic polyhydramnios was 3/57 (5.26%), thus suggesting a better overall neonatal outcome in the Idiopathic polyhydramnios group. The total no of Neonatal ICU admissions was 21 out of which 14 babies expired in NICU (Table 5).

CONCLUSION

In conclusion, severe polyhydramnios is more likely to have an underlying aetiology and to have adverse outcomes in pregnancy than mild polyhydramnios, which are mostly idiopathic and benign. A pregnancy complicated by polyhydramnios can present difficult diagnostic and therapeutic dilemmas for obstetricians. Polyhydramnios is an adverse prognostic factor for increased risk of pregnancy complications and an extensive evaluation of these pregnancies is recommended including multiple comprehensive ultrasound examinations, repeat diabetes screening, and amniocentesis for foetal karyotyping wherever indicated.

DISCLOSURE

Competing interest/ Conflicts of interest Statement

The authors declare that they have no competing interests.

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Ethics approval and consent to participate

The study was reviewed by the ethics committee of Government Medical College, Jammu, India and ethics approval was obtained. Informed consent was obtained from the participants as per the principles outlined in the Declaration of Helsinki (World Medical Association. Declaration of Helsinki: ethical principles for medical research).

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