

Fetal Outcome in Pregnancies Complicated with Polyhydramnios: Study Done in Pokhara, Nepal

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ABSTRACT

Introduction: Amniotic fluid plays an important role in the development of fetus. Any abnormality in the production amniotic fluid may have adverse effect on the fetus and the mother. Polyhydramnios is one of the common complications occurring during pregnancy and complicates around 0.2 - 2% of pregnancies.

Methods: It is a prospective study conducted in Manipal Teaching Hospital, Pokhara, Nepal from January 2013 to December 2015. All the pregnant ladies irrespective of gestational age with amniotic fluid index (AFI) 25 cm or more were enrolled for the study. According to the AFI, polyhydramnios was classified as mild (25 – 30 cm), moderate (30.1 - 35 cm) and severe (>35 cm). Fetal outcome, mode of delivery, presence of congenital anomalies, NICU admission and maternal glucose intolerance were recorded.

Results: Out of 8232 deliveries, 24 were diagnosed and admitted with the diagnosis of polyhydramnios. Mild polyhydramnios, 50% (n=12) occurred after 37 weeks of gestation and 12.5% (n=3) had severe polyhydramnios. All pregnant ladies 50% (n=12), beyond 37 weeks gestation had cesarean section, whereas 25% (n=6) had vaginal deliveries. 33.3% (n=8) had preterm labor, 12.5% (n=3) had premature rupture of membrane, 25% (n=6) had congenital anomalies, one IUFD, one case of Rh isoimmunisation and one case of twin pregnancy. NICU admission needed in 20.5% (n=5). Pregnant ladies with impaired glucose intolerance were 8.3% (n=2).

Conclusions: Polyhydramnios is associated with increased incidence of cesarean section, preterm labor, fetal malformation and NICU admission.

Keywords

Cesarean section, Fetal outcome, Polyhydramnios.

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INTRODUCTION

Amniotic fluid (AF) plays an important role for the growth and development of fetus. It also helps in providing nutrients to the fetus, has excretory functions, helps in development of fetal lungs, prevents ascending infections and acts as a shock absorber¹. Amniotic fluid volume (AFV) is determined by various sources like fetal urination, fetal swallowing reflex, secretions from fetal oral and nasal cavities, fetal lung fluid secretion, movement of water and

metabolites between the placenta and the fetal blood and transudation of water and electrolytes across the amnion and chorion. Any disturbance in this mechanism can lead to abnormal production of amniotic fluid². Polyhydramnios, one of the common condition in pregnancy is the excessive accumulation of AF. It complicates 0.2 - 2% of pregnancies^{3,4,5,6}. It is associated with fetal, placental and maternal causes which may result in adverse fetal and maternal outcome.

The objective of this study was to assess the fetal outcome in pregnancies complicated with polyhydramnios.

MATERIALS AND METHODS

This is a prospective study which was carried out in the Department of Obstetrics & Gynecology, Manipal College of Medical sciences & Teaching Hospital, Pokhara, Nepal. All pregnant women irrespective of gestational age diagnosed with polyhydramnios and were admitted in the hospital were included in the study. The study period was from January 2013 to December 2015. However, women who were diagnosed with medical problems like heart disease, acute and chronic medical illness were not included in the study. Polyhydramnios was diagnosed by assessing amniotic fluid index (AFI). Various methods have been described to measure the AF. The two most used methods to describe AF are 1) Vertical measurement of the single deepest pocket of amniotic fluid and values more than 8 cm is considered as polyhydramnios. 2) AFI- dividing the uterus in two halves by an imaginary line and taking the sum of vertical measurement of each of the four quadrants of the amniotic fluid. AFI more than 25 was taken as Polyhydramnios⁶. In this study AFI was taken to assess the polyhydramnios. The degree of polyhydramnios was categorized as mild (AFI 25 – 30 cm), moderate (AFI 30.1 -35 cm) and severe (AFI >35.1 cm)⁷. During the study period, there were 8232 deliveries and twenty four pregnant ladies without any chronic illness and admitted in the hospital were included in the study. A maternal variable such as age, parity, gestational age and mode of delivery was collected. Neonatal variables like Apgar score, birth weight, gross anomalies detected and NICU admission were collected.

RESULTS

During the study period from January 2013 to December 2015, there were total 8232 deliveries. Out of them, 24 pregnant ladies were diagnosed as polyhydramnios and admitted in the hospital.

Table 1: Age distribution in relation to AFI

Age	AFI (n=24)		
	25 - 30	31.5 - 35	>35
<20 yrs	1	-	-
20 - 30 yrs	12	-	2
>30 yrs	7	1	1

In this study, majority of the clients belong to the age group between 20 to 30 years, 58.3% (n=14) while only one client was under the age group 20 years. Three clients (12.5%) had AFI more than 35.

Table 2: Parity distribution in relation to AFI

Parity	AFI (n=24)		
	25 - 30	30.1 - 35	>35
P1	5	-	-
P2	6	-	1
P3	5	1	-
P4 and more	4	-	2

The number of clients in this study was 29.1% (n=7) belong to Para 2, 25% (n=6) in both Para 3 and Para 4 and more and only 20.8% (n=5) were Para 1.

Table 3: AFI in relation to gestational age

Gestational age	AFI 25 - 30	31.5 - 35	>35
<20 weeks	1	-	-
20 - 28 weeks	2	-	-
29 - 37 weeks	4	2	3
>37 weeks	12	-	-

This study that the majority of the women were more than 37 weeks of gestation, 50% (n=12) as compared to those who were between 29 - 37 weeks, 37.5% (n=9), 0.8% (n=2) were between 20 - 28 weeks and only one (0.41%) was less than 20 weeks of gestation. Majority, 79.2% (n=19) had AFI between 25 - 30cm and 12.55% (n=3) had AFI >35cm

Table 4: Mode of delivery in relation to AFI

AFI	Vaginal delivery	Elective cesarean section	Emergency cesarean section
25 - 30	3	6	10
31.5 - 35	2	-	-
>35	1	2	-

This study showed that 75% (n=18) women with polyhydramnios had cesarean section as compared to only 25% (n=6) who had vaginal deliveries.

Table 5: Mode of delivery in relation to gestational age

Gestational Age	Vaginal delivery	Elective cesarean section	Emergency cesarean section
<20 weeks	1	-	-
20 - 34 weeks	4	1	-
34 - 37 weeks	1	2	3
>37 weeks	-	4	8

This study showed that all the women with gestational age more than 37 weeks of gestation (n=12) had cesarean section as compared to women between 34 - 37 weeks gestation, five out of six had cesarean section. Women with gestational age less than 34 weeks (n=6) had vaginal delivery whereas only one had cesarean section.

Table 6: Outcome of fetus

Birth weight	<2 kg	2 - 2.5 kg	2.6 - 3 kg	>3 kg
	9	3	3	9
NICU admission	Yes	No	IUFD	NND
	5	15	1	6
Congenital anomalies	Yes	No		
	6	18		

This study showed that the number of newborns more than three kg and less than two kg were equal (37.5%, n=9 each) and similarly equal number of newborns were between the birth weight 2 - 2.5 kg and 2.6 - 3 kg (12.5%, n=3 each). Out of 24 newborns, 20.8% (n=5) needed NICU admission, 25% (n=6) had congenital anomalies, 25% (n=6) had neonatal death and one was IUFD.

Table 7: Factors related to polyhydraminos

	AFI- 25-30	30.1 - 35	>35
PIH	2	-	-
PROM	2	1	-
Preterm labor	5	1	2
Twin pregnancy	-	-	1
Rh incompatibility	-	-	1
Diabetes mellitus	2	-	-
Congenital anomalies	3	-	3
IUFD	-	1	-
Cord prolapse	-	-	-
PPH	-	-	-

DISCUSSION

Polyhydraminos is one of the conditions complicating pregnancy and is associated with adverse fetal and maternal outcome. It is also a challenge in obstetric management. Polyhydraminos may result from fetal causes such as decrease swallowing reflex of the fetus as in anencephaly, oesophageal atresia, choanal atresia, tracheoesophageal fistula, intestinal atresia. Other conditions are like increased urinary production, severe anemia, infections (Cytomegalovirus, toxoplasmosis, syphilis, parvovirus)

and maternal diabetes².

This study was done to assess the fetal outcome in relation to polyhydraminos, factors associated and the mode of deliveries.

In this study, the majority of the women who were diagnosed with polyhydraminos were in between the age group 21 - 30 years, 58.3% (n=14), 37.5% (n=9) were more than 30 years and only one was less than 20 years of age. Majority of the patients were parity 2, 29.1% (n=7), followed by parity 3 and 4 (n=6) respectively and the least in parity (20.8%, n=5). Kaur Tajinder and Sood Ruchika⁹ have also showed in their study that the majority of patients (57.1%) were in the age group between 27 - 35 years but however the incidence was more in nulliparous women which in contrast to this study which showed the incidence more among multipara, 79.1% (n=19). However in the study conducted by Tashfeen *et al*⁹ showed that the incidence of polyhydraminos was more in multiparous 81.1%.

In this study, mild polyhydraminos was more common after 37 weeks of gestation (50%, n=12) and severe polyhydraminos was 12.5% (n=3) which was found in between 29 - 37 weeks of gestation. Only one pregnant lady had mild polyhydraminos in less than 20 weeks of gestation. The result resembles the study done by Rutwa J. Chavda *et al*¹⁰ which showed that the incidence of polyhydraminos was more (86%) in the third trimester. Another study conducted by C Touboul *et al*¹¹ had observed higher frequency of polyhydraminos at the median gestational age of 39.1 weeks of gestation. Similarly, K Tajunder *et al*⁸ had also observed a higher frequency of polyhydraminos (57.1%) between 29 - 36 weeks of gestation. In this study the incidence of mild polyhydraminos was more, 79.2% (n=19) as compared to moderate 8.3% (n=2) and severe polyhydraminos (12.5, n=3). This is similar to the study conducted by Rutwa J Chavda *et al*¹¹ which showed that 55% had moderately elevated AFI and 6.8% had markedly elevated AFI. Similarly, the study conducted by Guin G *et al*¹² also showed that 55% had mild polyhydraminos and only 6.8% had severe polyhydraminos.

This study showed that 75% (n=18) pregnant ladies had cesarean section and only 25% (n=6) had vaginal deliveries. All the pregnant ladies (n=12) with gestational age more than 37 weeks had cesarean section. However study done by Guin G *et al*¹² and K Tajunder *et al*⁸ had only 22.2% and 28.6% cesarean section respectively. This study showed 25% (n=6) vaginal delivery which contradicts

the study conducted by Rutwa J Chavda *et al*¹¹, where the vaginal delivery was 82%. Similarly various studies have also shown higher percentage of vaginal deliveries.

Various studies have shown increased incidence of perinatal morbidity and mortality in pregnancies complicated with polyhydramnios^{13,14,15}. Studies conducted by Dashe *et al* and Damato *et al*¹⁷ had 79% and 63% of congenital anomalies identified respectively. However, this study showed only 25% (n=6) pregnant ladies of congenital anomalies. This may be due to the less number of pregnant ladies included in this study. Similarly, studies done by Rutwa J Chavda¹⁰ also had 31% of congenital malformation. Kouame N *et al*¹⁸ and Guin G *et al*¹² had showed only 1.6 % and 8% fetal malformation in their studies. This study showed 20.8% (n=5) NICU admission and one IUFD. Maymon *et al*¹⁹ have observed increased risk of perinatal death and congenital anomalies. Similarly, several studies have shown increased incidence of fetal malformation, increase rate of NICU admission and neonatal death^{20,21}.

This study showed that 33.3% (n=8) had preterm deliveries. Several studies have shown associations of preterm delivery with polyhydramnios. Salih Askin *et al*²² in their study showed 16.5% preterm deliveries. Similarly, Pri-Paz *et al*²³ and Dorlejin *et al*²⁴ reported higher incidence of preterm deliveries up to 20.5%. Ariel M *et al* had observed preterm deliveries as high as up to 40%. Similarly, Kaur Tajinder *et al*⁸ has observed higher incidence of preterm deliveries, 40%. In contrast, Kaukab Tashfeen *et al*⁹ had observed low incidence of preterm deliveries, 2.5%.

This study showed that 12.5% (n=3) had premature rupture of membrane. While Rutwa J Chavda *et al*¹⁰ have shown higher incidence of PROM, up to 44.5%. Studies have shown that the risk increases due to over distension of the uterus²⁵. Only one pregnant lady in this study had twin pregnancy and one with Rh incompatibility. Rutwa J. Chavda *et al*¹⁰ had also observed 6.6% of twin pregnancy and 4.4% Rh incompatibility in their study. Vasoconstriction leading to uteroplacental insufficiency is associated with oligohydramnios. Pregnancy induced hypertension (PIH) is rarely associated with polyhydramnios. In this study, only 8.3% (n=2) had PIH which is consisted with the findings done by Kuang Chao *et al* (3.9%). However, Rutwa J Chavda¹⁰ had observed 17.7% PIH with polyhydramnios.

This study showed that 8.3% (n=2) had associated impaired glucose tolerance. This is consistent with the

study conducted by, Rutwa J Chavda *et al*¹⁰ which showed the incidence being 9%. Studies have shown association between polyhydramnios and maternal pregestational and gestational diabetes²⁶. Literature have shown the prevalence of polyhydramnios in gestational diabetes ranging from 8 - 20%²⁷. Study done by Idris *et al*²⁸ had shown polyhydramnios among 18.8% pregnant ladies of gestational diabetes. Similarly, Guin G *et al*¹² have also reported 20% of gestational diabetes associated with polyhydramnios.

CONCLUSION

In this study, it was observed that polyhydramnios was associated with increased rate of cesarean deliveries. It was also associated with increased risk of preterm labor, congenital anomalies and NICU admission.

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