

Neonatal Outcome of Pregnancies with Oligohydramnios and Polyhydramnios

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ABSTRACT

Objective: To assess factors associated with neonatal outcome of pregnancies with oligohydramnios and polyhydramnios.

Study Design: Comparative Cross-sectional Study.

Place and Duration of Study: Department of Pediatrics and Gynecology, Fauji Foundation Hospital, Lahore Pakistan, from Oct 2020 to Sep 2021

Methodology: A prospective comparative study was conducted on the babies born to mothers diagnosed with oligohydramnios and polyhydramnios during the course of pregnancy. Neonates were evaluated by neonatologist within first 24 hours of birth. The cases were admitted and well babies were handed over to parents. The neonatal outcome parameters were observed in all these babies for first two weeks of life. Those who lost follow up they were excluded from study. Age of mother, gestational age of baby, maternal hypertension and maternal diabetes were associated with presence of complications among these babies.

Results: Two thousand One hundred and Twenty-nine deliveries took place in given duration. About 322 had either polyhydramnios or oligohydramnios. About 150 cases could be followed completely. Fifty-five (36.7%) showed presence of one or more complications, of which 29(41.4%) cases had oligohydramnios and 26(32.5%) had polyhydramnios. Maternal age and presence of maternal diabetes and maternal hypertension had statistically significant association with complications in neonates (p -value <0.005).

Conclusion: Complications rate was high among neonates born to mothers with oligohydramnios or polyhydramnios. Advanced maternal age, presence of diabetes mellitus and hypertension were factors association with presence of complications in neonates included in our study.

Keywords: Neonates, Oligohydramnios, Outcome, Polyhydramnios.

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INTRODUCTION

Neonatology has been revolutionized in last two decades like all other specialties of medical field and mortality and morbidity related to neonates had decreased over the years especially in high risk and difficult pregnancies.¹ Huge number of un-booked pregnancies, deliveries outside hospital and heavily burdened nursing units in our country still account for high mortality and morbidity as compared to other parts of the world.² Health related conditions of mother during the course of pregnancy, labor or delivery may prone the babies to develop complication during early or late neonatal period.³

Maternal homeostasis parameters are directly linked with fetal well-being not only during the course of pregnancy but can also affect labor and babies in neonatal period.⁴ Pre-term birth, intrauterine growth retardation, infections, metabolic problems, low

APGAR score at birth or intrauterine or early neonatal death are some of the complications which may occur in neonates who are born to mothers with health problems during pregnancy including amniotic fluid volume issues.^{5,6}

Obstetricians and pediatricians across the globe have been interested in mother and child health in pregnancies with amniotic fluid abnormalities. Simmons *et al.* in 2020 concluded that birth weight of newborns was significantly higher in babies born to mothers with polyhydramnios while it was significantly lower than normal in babies born to mothers with oligohydramnios.⁷ An interesting study was published on Indian population by Lallar *et al.* in 2015 highlighting perinatal outcome in babies born to mothers with idiopathic oligohydramnios.⁸ They concluded that idiopathic polyhydramnios is associated with higher perinatal morbidity and mortality than normal pregnancy. Figueroa *et al.* tried to generate similar data from multiple lower and middle income countries and studied fetal and maternal outcome in mothers who

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had oligohydramnios during pregnancy. They revealed that lower and middle income countries had alarming statistics in this regard and worse outcome was seen in both mothers and babies.⁹

Twenty first century had brought a lot of changes in health care across the globe but still number of unbooked antenatal cases is huge in Pakistan. Screening for fetal or maternal abnormalities is usually limited to a certain group of population. A Small local study was conducted on patients with oligohydramnios and it was concluded that isolated oligohydramnios was not associated with adverse perinatal outcomes but it increased the risk for labor induction and caesarean section.¹⁰ Limited local data has been available in this regard, we therefore planned this study with the rationale to assess neonatal outcome of pregnancies with oligohydramnios and polyhydramnios and factors associated with poor outcome in patients managed at Fauji Foundation Hospital Lahore.

METHODOLOGY

This comparative cross-sectional study was conducted at the obstetrics unit and neonatal intensive care unit of Fauji Foundation Hospital Lahore from October 2020 to September 2021. Non probability Consecutive sampling technique was used to gather the sample. Sample size was calculated by WHO Sample Size Calculator by using population prevalence proportion of complications in preterm babies as 3.1%.¹¹

Inclusion Criteria: All booked pregnancies in the period of study including multiple gestations.

Exclusion Criteria: Mothers with chronic physical health conditions were excluded. Mothers who lost to follow up after delivery or those who first reported at the time of labor or delivery and assessed first time at that time were not included as well.

After ethical approval from the ethical review board committee (via letter number 0042/36) and written informed consent from the women, women and neonates fulfilling the above mentioned inclusion and exclusion criteria were included in the study. Oligohydramnios (AFI <5cm or a pocket <2cm) and polyhydramnios (Amniotic Fluid Index) (AFI) ≥24cm or single deepest pocket (SDP) ≥8cm) was diagnosed by consultant obstetrician on the basis of detailed clinical and radiological assessment during the course of pregnancy.^{12,13} Record was well maintained of maternal age, gestational age at birth, maternal diabetes, maternal hypertension, presence or absence of oligohydramnios or polyhydramnios.

After being born babies were assessed by neonatologist within first 24hrs of life. Healthy babies were handed over to parents and called for follow up at day 7 and 14 of age.¹⁴ Neonatal outcome parameters (all the neonatal complications) were observed by consultant pediatrician or neonatologist. Those who lost to follow up, they were excluded from study.

Statistics Package for Social Sciences version 24.0 (SPSS-24.0) was used for the data analysis. Characteristics of mothers and neonates participating in the study and the outcome variables were described with the help of descriptive statistics. Pearson chi-square analysis and Fischer exact test were done to evaluate the association of presence of complications with different sociodemographic factors in our study participants. The *p*-values ≤0.05 were considered significant for establishing the association between variables.

RESULTS

A total of 2129 deliveries took place in given duration. About 322 had either polyhydramnios or oligohydramnios. 150 cases had complete follow up. Mean age of the women included in the study was 34.53±6.561 years. Out of 150 neonates born with polyhydramnios or oligohydramnios, 95(63.3%) did not show any complication while 55(36.7%) showed presence of one or more complications. 84(56%) neonates were male while 66(44%) neonates were female. Caesarean section 76(50.7%) was the commonest mode of delivery in women who were diagnosed with oligohydramnios or polyhydramnios.

Table-I summarized the general characteristics of study participants. 33(22%) were admitted at NICU, 11(7.3%) had congenital pneumonia, 10(6.7%) were IUGR, 11(7.3%) had poor APGAR, 12(8.0%) developed early onset sepsis, 6(2.6%) were born with congenital abnormalities and 1(0.7%) neonatal death.

Table-II summarized the results of statistical analysis. 26(51%) mothers above 35 years of age, 24(77.4%) mother with diabetes mellitus and 22(81.5%) mother with hypertension had newborns with one or more complications. It was found that advanced maternal age, presence of diabetes and hypertension among pregnant women had statistically significant association with presence of complication in neonates (*p*-value<0.05)

Table-III showed that rate of complications was slightly high in case of oligohydramnios 29(41.4%) than polyhydramnios 26(32.5%) but the difference was not statistically significant (*p*-value >0.05)

Table-I: Characteristics of mothers and neonates included in the study

Study parameters	n (%)
Age of mothers (years)	
Mean±SD	34.53±6.561 years
Range (min-max)	19-44 years
Gender of Neonates	
Male	84(56%)
Female	66(44%)
Methods Used for Delivery	
Vaginal delivery	39(26%)
Caesarian delivery	76(50.7%)
Instrumental delivery	-
Forceps delivery	22(14.7%)
Vacuum delivery	13(8.7%)
Amniotic Fluid Disorder	
Polyhydramnios	80(53.3%)
Oligohydramnios	70(46.7%)
Poor Neonatal Outcomes	
Admission at NICU	33(22%)
Congenital pneumonia	11(7.3%)
Intrauterine growth retardation	10(6.7%)
APGAR<7 at 5 minutes	11(7.3%)
Early onset sepsis	12(8.0%)
Congenital abnormalities	06(2.6%)
Others	03(1.3%)
Neonatal death	01(0.7%)

Table-II: Factors associated with neonatal outcome in babies included in our study (Pearson Chi-square test)

Factors	No Complications	Complications	Total Cases	p-value
Age (years) of Mothers				
<35	70(70.7%)	29(29.3%)	99(100%)	0.010
35-45	25(49.0%)	26(51.0%)	51(100%)	
Gestational Age of Baby				
Born at term	87(64.9%)	47(35.1%)	134(100%)	0.249
Pre/post term	08(50.0%)	08(50.0%)	16(100%)	
Diabetes Mellitus				
No	88(73.9%)	31(26.1%)	119(100%)	<0.001
Yes	07(22.6%)	24(77.4%)	31(100%)	
Hypertension				
No	90(73.2%)	33(26.8%)	123(100%)	<0.001
Yes	05(18.5%)	22(81.5%)	27(100%)	

Table-III: comparative analysis of neonatal complications rate between cases with oligohydramnios and polyhydramnios

Amniotic fluid disorder	Complications		Total	p-value
	Yes	no		
Oligohydramnios	29(41.4%)	41(58.6%)	70(100%)	0.258
Polyhydramnios	26(32.5%)	54(67.5%)	80(100%)	
Total	55(36.7%)	95(63.3%)	150(100%)	

DISCUSSION

Babies born to mothers with amniotic fluid volume disturbances may be prone to adversity inside mother’s womb and may develop complications

before, during or after the birth. Due to advancements in obstetric care and radiological facilities, number of untoward parameters can be picked up early and addressed in time in order to prevent serious consequences. Oligohydramnios and polyhydramnios are not uncommon conditions during pregnancy and need to be addressed and looked after well in order to have a better pregnancy outcome. This study was conducted to assess neonatal outcome of pregnancies with oligohydramnios and polyhydramnios and factors associated with poor outcome.

Taneja *et al.*¹⁵ in 2017 assessed the adverse effect of isolated oligohydramnios on perinatal outcome in a case series. They came up with the findings that though almost all cases had to be operated via caesarian section but none of neonates had serious complications in their case series. Cesarean remained commonest mode of delivery in our study participants as well as in study of Taneja *et al.* But considerable number of neonates in our study had either mild or serious complications. Reason for that may be different study design used in our study and also inclusion of polyhydramnios patients.

Volante *et al.* conducted a study and studied impact of alteration of the amniotic fluid on neonatal outcome. They stated that multiple factors lead to complications in babies born to mothers having amniotic fluid abnormalities. Severe oligohydramnios was most disastrous condition out of all amniotic fluid abnormalities with worst maternal and neonatal outcome.¹⁶ Our study supported their stance as complication rate was quite high among neonates born to mothers with oligohydramnios or polyhydramnios and more than half of the patients had to undergo delivery via caesarian section which has its own morbidity for both mother and new born.

Baksh *et al.* in 2021 published a retrospective cohort study to assess the effect of amniotic fluid disorders on maternal and fetal outcome and mode of delivery.¹⁷ They came up with the findings that diabetes mellitus and gestational diabetes were risk factors associated with amniotic fluid disorders. Cesarean section was commonest mode of delivery in patients with amniotic fluid disorders. Our findings supported the results generated by Baksh *et al.*

Perinatal outcomes of isolated oligohydramnios at term and post-term pregnancy was assessed by Rossi *et al.*¹⁸ in a systematic review and meta-analysis. Studies they included did not reveal any positive results and there was no difference in mortality and

morbidity between normal pregnancies and pregnancies with oligohydramnios. Our results were different in this regard. Study population being from lower and middle income countries may be one of most important reason for difference in these findings.

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LIMITATIONS OF STUDY

This was data from one department and could not be generalized. Diagnosis of amniotic fluid abnormality was made by different consultants seeing patients on their respective day therefore data may be prone to observer bias. Other complications or clinical conditions in pregnancy can also affect neonatal outcome. Moreover, only short term complications in neonates were noted. Long term follow-up of mothers and babies may generate better results in this regard.

CONCLUSION

Complication rate was quite high among neonates born to mothers with problems of amniotic fluid (oligohydramnios/polyhydramnios). Advanced maternal age, maternal diabetes mellitus and maternal hypertension were factors association with presence of complications in neonates included in our study.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

AS & JJ: Supervision, Conception, Study design, analysis and Interpretation of data, Critically reviewed manuscript & approval for the final version to be published.

MS & JUH: Data entry, analysis and interpretation, manuscript writing & approval for the final version to be published.

RK & ZM: Critically reviewed, Drafted manuscript & approval for the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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