

FETAL OUTCOMES IN PREGNANCIES COMPLICATED BY OLIGOHYDRAMNIOS- EXPERIENCE AT A TERTIARY CARE HOSPITAL

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ABSTRACT

To find out the association between oligohydramnios and fetal outcome in terms of mode of delivery, the weight of the newborn baby, APGAR score at 1 and 5 minutes, and admission to the neonatology unit.

Materials & Methods: This prospective cohort study was conducted in Obstetrics and Gynaecology Department, Khyber Teaching Hospital, Peshawar from 1st June 2017 to 31st May 2018. Patients with singleton pregnancy and cephalic presentation with a period of gestation of about 37 weeks or above were included using a purposive non-probability sampling technique. A sample of 100 patients in Group A (exposed) whose AFI was < 5 in the absence of other associated risk factors were compared to 100 matched groups of subjects in Group B (non-exposed) with AFI 5—18. Pregnant women with gestational age <37 weeks, fetal congenital abnormalities, and pregnancies with co-morbidities like PIH, and pre-eclampsia were excluded from the study.

Results: The result comparison shows that Group A has a higher rate of labor induction and cesarean section than Group B. However, there was no statistically significant difference in the weight of the newborn, APGAR score at 1 and 5 minutes, and admission to the neonatology unit in both groups.

Conclusion: Oligohydramnios is associated with a higher rate of induction of labor and cesarean section, but it does not affect the weight of newborn babies, APGAR score at 1 and 5 minutes, and admission of the newborn to the neonatology unit.

Key Words: Oligohydramnios, Amniotic fluid, Cesarean section, Induction of labor, APGAR score, Perinatal outcome

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INTRODUCTION

The fluid around the fetus during pregnancy is called amniotic fluid. It performs multiple functions like it protects the fetus from external forces and infection, regulating the temperature around it, and also providing free-floating space to the growing fetus which helps in the growth of lungs, muscles, and bones under a normal amount of liquor¹. It is measured in the form of mean vertical pool (MVP), amniotic fluid volume (AFV), and AFI². The amount of amniotic fluid is less in early pregnancy and it increases during pregnancy with a peak of 800 ml around 34 weeks of gestation. After this, it decreases in amount to 500 ml at 40 weeks of gestation³. Amniotic fluid volume is regulated through a complex mechanism. Abnormalities in

this mechanism may lead to either increase or a decrease in liquor volume which is undesirable⁴. Oligohydramnios is a decrease in amniotic fluid volume, MVP<2cm, AFV<200 ml, AFI<5, or AFI below the 5th percentile for the period of gestation is called oligohydramnios which complicates 0.5% - 5% of all pregnancies⁵. Diagnosis of Oligohydramnios is not a good sign as it is associated with adverse antepartum, intrapartum, and perinatal pregnancy outcomes, especially if develops during early pregnancy⁶.

Oligohydramnios may either be caused by loss of amniotic fluid or underproduction of it. In some cases, the cause may be very simple, just maternal dehydration while in others can be complicated⁷. Congenital fetal urinary tract abnormalities may cause a decreased amount of liquor as well⁸. Utero-placental insufficiency due to maternal hypertension and chronic kidney disease may also cause oligohydramnios in a structurally normal fetus. Maternal intake of certain drugs like ACE inhibitors and prostaglandin synthase inhibitors (indomethacin) also causes less production of amniotic fluid. Loss of amniotic fluid due to pre-labour pre-term rupture of membranes (PPROM) also causes oligohydramnios⁹. Oligohydramnios is an indica-

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tor of adverse perinatal outcomes. The earlier it develops, the poorer the prognosis. Fetal complications include pulmonary hypoplasia, early IUGR, and iatrogenic prematurity due to early interventions in such pregnancies. Maternal complications are due to their relation to uncontrolled hypertensive disorders and chorio-amnionitis¹⁰.

Management depends upon the severity of oligohydramnios, gestational age at diagnosis, and the underlying cause. Severe oligohydramnios is an indication for delivery. Pregnancies complicated with oligohydramnios have an increased risk of cesarean section and instrumental delivery due to fetal distress and meconium staining of liquor. ¹¹ An increase in the cesarean section rate is not desirable as it compromises the maternal obstetrical future. With 1 cesarean section, the risk of repeat cesarean section is increased in subsequent pregnancies with its associated increased risk of placenta previa and morbidly adherent placenta. Performing a cesarean section due to anxiety of threat to fetal life should be avoided to reduce the cesarean section rate. It is only possible when we follow evidence-based practice. We need studies to establish an evidence-based practice. In Pakistan, very few studies are available on this topic. This study was done to find out the association of isolated oligohydramnios with cesarean section rate and fetal status as assessed by weight of the newborn baby, APGAR score at 1 and 5 minutes, and admission to the neonatology unit.

MATERIAL AND METHODS

This study was carried out in the Department of Obstetrics and Gynaecology, Unit A, Khyber Teaching Hospital Peshawar from 1st June 2017 to 31st May 2018. The study design was a prospective cohort with approval from the hospital's ethical committee. Patients having singleton live pregnancy with cephalic presentation and a period of gestation of 37 weeks or above were included in the study. While, pregnant women with gestational age <37 weeks, fetal congenital abnormalities, and pregnancies complicated with PIH, pre-eclampsia. A sample of 100 patients whose AFI was <5 in the absence of associated risk factor (exposed) Group A was compared to 100 matched group of the subject with AFI 5 -18 (non-exposed) Group B. Purposive non-probability technique was used for sampling.

Personal and obstetrical information were recorded on pre-formed Proforma. Labour was monitored in both groups by use of a partogram. The mode of delivery was decided according to standard obstetric protocol. Mode of delivery, the weight of the newborn baby, APGAR score at 1 and 5 minutes, admission to the neonatology unit, and neonatal deaths were recorded. Data was entered in SPSS version 20. Descriptive statistical analysis was used to calculate frequencies, percentages, and SD for numerical data. Qualitative variables (mode of delivery, APGAR score, weight of the baby, NICU admission, and neonatal

deaths) between the two groups were compared by chi-square test, and a P-value of less than 0.05 was taken as significant.

RESULTS

The duration of the study was 1 year. 100 patients in Group A with AFI <5 (exposed) were compared to 100 matched patients in Group B with AFI 5—18 (nonexposed). Both the cases and controls were matched according to age, BMI, parity, and other demographic characteristics. Primigravidae were 16% and multi-gravidae 84% in Group A while primigravidae were 13% and multi-gravidae were 87% in Group B. More than half (59%) of patients needed induction of labor in group A while labor was induced in only 5% of patients in group B. 34% of the patients had undergone a cesarean section in Group A while 4% ended up in a cesarean section in Group B. The difference was found to be statistically significant (p-value < 0.001).

The mean baby weight in Group A was 2.95 with an SD of 0.481, while in Group B mean baby weight was 3.001 with an SD of 0.4006. No statistically significant difference was found in baby weight in both groups (p-value 0.503). 25% of newborn babies in Group A had an APGAR score <7 and 23% of newborn babies in Group B had an APGAR score <7. Apgar score >7 at 1 minute was found in 75% of newborn babies in Group A and 77% of newborn babies in Group B. 14% of newborn babies in Group A and 11% of newborn babies in Group B had an Apgar score <7 at 5 minutes. APGAR score >7 at 5 minutes was found in 86% of newborn babies in Group A and 89% of newborn babies in Group B. This difference between the 2 groups was not statistically significant. (p-value 0.741 and 0.521 respectively). 5 newborn babies needed NICU care in Group A while 3 newborn babies were sent to NICU in Group B (p-value 0.47). No neonatal deaths were recorded in either group.

DISCUSSION

We carried out our study at Khyber Teaching Hospital. It is a tertiary care hospital in the major city of the province of Khyber Pakhtunkhwa. It caters to a large population. It not only provides services to the nearby areas but also complicated patients referred from other districts are provided quality treatment here.

Results of our study show that the rate of induction and cesarean section in pregnancies complicated by oligohydramnios was significantly higher than pregnancies with the normal amount of liquor while the weight of the newborn baby, APGAR score at 1 and 5 minutes, admission to neonatology unit and neonatal deaths were similar in both groups. Similar results are reported by Asifa et al¹². However, a study by Iqbal et al. ¹³ reveal that fetal outcome is worse in cases of oligohydramnios in terms of APGAR score and NICU admission. In Group A 59% of patients needed induction of labour compared to 5% in Group B.

Table 1: SHOWING COMPARISON OF FETAL OUTCOME BETWEEN GROUP A AND GROUP B

VARIABLES		GROUP A (EXPOSED) N (%)	GROUP B (UNEXPOSED) N (%)	CHI SQUARE (df)	P- VALUE
LABOR	SPONTANEOUS	59(59%)	95(95%)	36.59(1)	0.000
	INDUCED	41(41%)	5(5%)		
BABY WEIGHT (Kg)		2.959±0.4814	3.001±0.4006		0.503
MODE OF DELIVERY	CAESAREAN SECTION	34(34%)	4(4%)	40.65(6)	0.000
	NVD	33(33%)	61(61%)		
	NVD WITH EPISIOTOMY	19(19%)	27(27%)		
	FORCEPS DELIVERY	1(1%)	2(2%)		
	BREECH VAGINAL DELIVERY	12(12%)	2(2%)		
	VACUUM VAGINAL DELIVERY	1(1%)	2(2%)		
APGAR SCORE IN 1 MINUTE	<7	25(25%)	23(23%)	0.11(1)	0.741
	>7	75(75%)	77(77%)		
APGAR SCORE AT 5 MINUTE	<7	14(14%)	11(11%)	0.41(1)	0.521
	>7	86(86%)	89(89%)		
NICU ADMISSION	YES	5(5%)	3(3%)	0.52(1)	0.47
	NO	95(95%)	97(97%)		

This difference was found to be statistically significant with a p-value of 0.000. Locatelli et al observed similar results where 50% of patients with oligohydramnios needed induction of labour¹⁴. Approximately 8-fold increase in the cesarean section rate was found in Group A(34% vs. 4%). The majority of cesarean sections were performed for fetal distress followed by failed induction. Banu R found similar results.¹⁵ The difference in weight of the newborn babies in both groups was not statistically significant. It is in contrast to the results reported by Locatelli¹⁶ who reported low birth weight of newborn babies of pregnancies complicated by oligohydramnios.

The difference in APGAR scores at 1 and 5 minutes in both groups was not statistically significant, while a study conducted by Karya J et al reported low APGAR scores in women with oligohydromnios¹⁷. 5% of our newborn babies went to NICU in Group A and 3% in Group B. It is very low in comparison to the statistics reported by Prajapati S et al¹⁸ where NICU admission was needed for 19% of the newborn babies. No deaths were reported in either group. Similar results are reported by Rainford et al¹⁹. Zhang J et al conducted the largest multicenter randomized Routine Antenatal Diagnostic Imaging with Ultrasound (RADIUS trial). It reinforces that reduced liquor volume is not associated with a higher risk of poor perinatal outcomes.²⁰ However, a recent multicenter prospective study in low and middle-income countries revealed that oligohydramnios is associated with adverse maternal and fetal outcomes.²¹

The strengths of the study are that it was a prospective, comparative study and carried out in a large public, tertiary care hospital where patients from all so-

cio-economic and demographic groups are managed. Limitations of the study include its relatively small sample size and being a single-center study.

CONCLUSION

Oligohydramnios in the absence of other risk factors is not associated with a higher risk of adverse perinatal outcome. The rate of cesarean section and induction of labor is increased in pregnancies complicated by oligohydramnios.

REFERENCES

- Jennifer A Tamblyn and R Katie Morris. Aberrant liquor volume. In: David M. Luesley, Mark D. Kilby. Obstetrics and Gynaecology. An evidence based text for the MR-COG. 3rd Edition. Boca Raton, London, New York: CRC Press, 2016, 292—299.
- Pekar-Zlotin M, Kugler N, Accart Z, Nimrodi M, Melcer Y, Cuckle H, Maymon R. Oligohydramnios: how severe is severe?. The Journal of Maternal-fetal & Neonatal Medicine: the Official Journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians. 2021 Feb 28:1-7.
- Hughes DS, Magann EF, Whittington JR, Wendel MP, Sandlin AT, Ounpraseuth ST. Accuracy of the ultrasound estimate of the amniotic fluid volume (amniotic fluid index and single deepest pocket) to identify actual low, normal, and high amniotic fluid volumes as determined by quantile regression. Journal of Ultrasound in Medicine. 2020 Feb;39(2):373-8.

4. Magann EF, Whittington JR, Morrison JC, Chauhan SP. Amniotic fluid volume assessment: eight lessons learned. *International Journal of Women's Health*. 2021 Aug 14;773-9.
5. Amir F, Ara G, Basharat A, Amir S. Fetomaternal Outcome In Women With Oligohydramnios Induced With Misoprostol. *J Ayub Med Coll Abbottabad*. 2019 Jul-Sep;31(3):407-410. PMID: 31535516.
6. Pergialiotis V, Bellos I, Fanaki M, Antsaklis A, Loutradis D, Daskalakis G. The impact of residual oligohydramnios following preterm premature rupture of membranes on adverse pregnancy outcomes: a meta-analysis. *American Journal of Obstetrics & Gynecology*. 2020 Jun 1;222(6):628-30.
7. Azarkish F, Janghorban R, Bozorgzadeh S, Arzani A, Balouchi R, Didehvar M. The effect of maternal intravenous hydration on amniotic fluid index in oligohydramnios. *BMC Research Notes*. 2022 Mar 7;15(1):95.
8. Liu Y, Shi H, Yu X, Xiang T, Fang Y, Xie X, Pan X, Li X, Sun Z, Zhang B, Fu S. Risk factors associated with renal and urinary tract anomalies delineated by an ultrasound screening program in infants. *Frontiers in Pediatrics*. 2022 Jan 24;9:728548.
9. Thomson AJ, on behalf of the Royal College of Obstetricians and Gynaecologists. Care of Women Presenting with Suspected Preterm Prelabour Rupture of Membranes from 24+0 Weeks of Gestation. *BJOG* 2019;126:e152–166
10. Morris R, Meller C, Tamblyn J et al. Association and prediction of amniotic fluid management for adverse pregnancy outcome: systematic review and meta-analysis. *BJOG*2014;121:686–99.
11. Liabsuetrakul T, Meher S, WHO Intrapartum Care Algorithms Working Group, Ciabati L, De Oliveira LL, Souza R, Browne J, Rijken M, Fawcus S, Hofmeyr J, Liabsuetrakul T. Intrapartum care algorithms for liquor abnormalities: oligohydramnios, meconium, blood and purulent discharge. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2022 Apr 12.
12. Siraj A, Baqai S, Naseer S, Raja A. The effect of uncomplicated oligohydramnios on perinatal outcome. *Pak Armed Forces Med J* 2016;66(3):333–36.
13. Iqbal I, Asghar S, Nisa K, Rashid F, Quredhi KK, Iqbal RR, Asghar S, Nisa K, Rashid F, Quredhi KK, Riaz R. Case-Control Study on Fetal Outcomes in Isolated Oligohydramnios in Third Trimester. *Journal of Rawalpindi Medical College*. 2022 Mar 31;26(1).
14. Locatelli A, Zaqarella L, Toso L, Assi F, Ghidini A, Biffi A. Serial assessment of AFI in uncomplicated term pregnancies: Prognostic value of amniotic fluid reduction. *J Maternal Foetal Neonatal Med* 2004; 15:233–6.
15. Banu R. Fetal and maternal outcome in oligohydramnios pregnancy (37-40 weeks). *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2021 Feb 1;10(2):606.
16. Locatelli A, Vergani P, Toso L, Verderio M, Pezzullo JC, Ghidini A. Perinatal outcome associated with oligohydramnios in uncomplicated term pregnancies. *Arch Gynecol Obstet* 2004; 269:130–3.
17. Karia J, Ninama P, Pateliya P, Karnavat R. Foeto-maternal outcome in oligohydramnios. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2022 Feb 1;11(2):482-6.
18. Prajapati S, Johar S. Feto-maternal outcome of oligohydramnios in tertiary care hospital. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2021 Nov 1;10(11):4101-7.
19. Rainford M, Adair R, Scialli AR, Ghidini A, Spong CY. Amniotic fluid index in the uncomplicated term pregnancies. Prediction of the outcome. *J Report Med* 2001;46:589–92.
20. Zhang J, Troendle J, Meikle S, Klebanoff MA, Rayburn WF. Isolated oligohydramnios is not associated with adverse perinatal outcome. *BJOG* 2004;111:220–5.
21. Figueroa L, McClure EM, Swanson J, Nathan R, Garces AL, Moore JL, Krebs NF, Hambidge KM, Bauserman M, Lokangaka A, Tshetu A. Oligohydramnios: a prospective study of fetal, neonatal and maternal outcomes in low-middle income countries. *Reproductive Health*. 2020 Dec;17(1):1-7

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Akhtar Z: Concept, Study design, Discussion, Manuscript writing

Afridi F: Analysis, Interpretation

Gilani S: Concept, Critical Review

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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