Original Article

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Pregnancy Outcome in Polyhydramnios after 28 Weeks of Gestation

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Abstract

Background: Polyhydramnios carries a high rate of complications during pregnancy and adverse perinatal outcomes. The aim of this investigation was to evaluate the Pregnancy oucome in polyhydramnios. *Methods:* The prospective study carried out in Mangalore Fetal Medicine Centre, which is specialized centre for obstetric ultrasonography from Jan 2014 to June 2016. Possible confounding factors that could affect the occurrence of polyhydramnios were analyzed. We then investigated the relative risks of these events to adverse perinatal outcome by adjusting the variants. *Results:* Significantly higher incidences of preeclampsia, placental abruption, placenta accreta, past history of fetal death or preterm delivery, multiple pregnancy, bodyweight gain 20kg during pregnancy and primiparity were noted in patients with polyhydramnios than in patients without this condition. The presence of polyhydramnios significantly increased the rate of preterm delivery,low birth weight or very low birth weight, low one- and five-minute Apgar scores, fetal death, large for gestational age babies, meconium-stained amniotic fluid, Cesarean section, fetal distress in labor, NICU transfer and neonatal death. *Conclusions:* Polyhydramnios carried a higher incidence of adverse perinatal outcomes,such as low Apgar scores, fetal death, fetal distress in labor, NICU transfer and neonatal death, despite exclusion of congenital anomalies from the study population. Detailed antepartum fetal well-being surveillance, intensive intrapartum monitoring and further attention to postpartum are warranted in patients with this condition.

Keywords: Polyhydramnios; Perinatal Outcome; NICU.

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Introduction

Polyhydramnios, defined as an amniotic fluid index (AFI) greater than 24 cm on linear-array real-time obstetric ultrasound, occurs in 0.4% to 3.3% of all pregnancies [1]. A higher rate of complications during pregnancy has been associated with polyhydramnios assessed either by the single largest pocket measurement or using a semi-quantitative manner [1,2]. Perinatal morbidity and mortality rates also significantly increase [3-5].

There are various etiologic factors of polyhydramnios and this condition may complicate many maternal and fetal problems [6,8]. Congenital fetal anomalies constitute one of the important etiologic factors associated with polyhydramnios and have an influence on the management and prevalence of adverse pregnancy outcomes [7,8]. The purpose of this investigation was to evaluate the risks of adverse perinatal outcomes in study population with polyhydramnios but without congenital fetal anomalies after the gestational age of 28 weeks.

Multivariate analysis was done to assess whether the increased risk for adverse

perinatal outcomes was due to polyhydramnios or to its significant association with other risk factors.

Methods

To investigate the adverse perinatal outcomes with polyhydramnios, women who attended Mangalore Fetal Medicine Centre from Jan 2014 – June 2016 for pregnancy scan after 28 weeks with polyhydramnios were recruited. Pregnancies complicated by congenital fetal anomalies were excluded. Polyhydramnios is defined as an AFI of greater than 24 cm or more by sonography [9]. AFI measurements were performed as described by Phelane et al [10].

Patients with polyhydramnios constituted the polyhydramnios group. Those with a normal amniotic fluid volume (5 cm <AFI<24 cm) served as the control group.

The perinatal period was defined as a pregnancy after 28 weeks gestation but before the seventh day after birth. Measurements of adverse perinatal outcomes included the incidences of preterm delivery (less than 37 weeks), low birth weight (less than 2500 gm) or very low birth weight (less than 1500 gm), macrosomia (more than 4000 gm), one- and five-minute Apgar scores less than 7, cord looped around the neck, fetal death, small for gestational age (SGA) (defined as birth weight below the tenth percentile for gestational age) babies [11], large for gestational age (LGA) babies, meconium-stained amniotic fluid, Cesarean section, instrument delivery, fetal distress in labor, neonatal death within the first seven days after birth and admission to a neonatal intensive care unit (NICU) as determined by attending neonatologists. This study consisted of two steps. The first step was to evaluate the possible confounding factors affecting the occurrence of polyhydramnios and then perinatal outcome.

Those factors we assumed initially included gravidity, parity, maternal obesity (defined as a body mass index of 27 kg/m2 or more before pregnancy), fetal gender, multiple pregnancy, preeclampsia, diabetes (either overt or gestational), postterm pregnancy (after 42 weeks' gestation), advanced maternal age (older than 34 years), placental abnormalities (placental abruption, placenta previa or placenta accreta [12] and previous obstetric history (fetal death,preterm delivery, ectopic pregnancy or abortions). Statistical comparisons were performed using SPSS for Windows. A p value < 0.05 was considered statistically significant.

Results

Over a 30 month period from Jan 2014 to Jan 2016, complete pregnancy outcome got by following up of patient. During this period 4227 pregnant women came for pregnancy scan after 28 weeks. Among these patients, 74 patients (1.75%) met the criteria for polyhydramnios, another 4044 (95.67%) had normal amniotic fluid volumes, and the remaining 109 (2.58%) had oligohydramnios. After exclusion of those with congenital abnormalities,69 patients had polyhydramnios, and 3902 patients had normal amniotic fluid volumes. The gestational ages at delivery ranged from 29 to 42 weeks. The mean gestational ages at delivery in patients with polyhydramnios and normal amniotic fluid volumes were 36.92 ± 3.61 and 38.64 ± 3.72 weeks, respectively.

The mean fetal body weights at delivery in patients with polyhydramnios and normal amniotic fluid volumes were 2837.70 ± 432.24 and 3086.45 ± 496.04 gm, respectively. Both were statistically significant (p<0.001).Significantly higher incidences of preeclampsia, placental abruption, past history of preterm delivery, multiple pregnancy,

Primiparity were noted in the patients with polyhydramnios (Table 1). There were no significant differences in gravidity, fetal gender, maternal obesity, diabetes (either overt or gestational), postterm pregnancy, advanced maternal age, placenta previa and incidences of previous abortion and ectopic pregnancy between groups.

Table 2 demonstrates the comparisons of adverse pregnancy outcomes, mode of delivery and neonatal condition after adjusting for the above significant confounding factors. The presence of polyhydramnios

Table 1: Significant Confounding Factors Affecting the Occurrence of Polyhydramnios

Confounding factors	Poly hydramnios (69)		Control group (3902)	
	N	%	N	%
Preeclampsia	2	2.89	66	1.69
Abruption	4	5.8	36	0.92
Past history preterm	4	5.8	42	1.08
Multiple pregnancy	13	18.84	122	3.13
Primiparity	39	56.52	1866	47.82

Table 2: Association of Polyhydramnios with Adverse Pregnancy Outcome, Mode of Delivery and Neonatal Condition

Pregnancy outcome	Poly hydramnios (69)		Control group (3902)	
	N	%	N	%
Preterm delivery<37weeks	19	27.54	284	7.28
Birth weight<2500 g	16	23.19	233	5.97
Birth weight<1500 g	7	10.14	37	0.95
Birth weight 4000 g	3	4.35	135	3.46
1-minute Apgar score<7	11	15.94	101	2.59
5-minute Apgar score<7	8	11.59	45	1.15
Cord looped around neck	9	13.04	581	14.89
Fetal death	3	4.35	17	0.44
Small for gestational age	11	15.94	268	6.87
Large for gestational age	11	15.94	432	11.07
Meconium	13	18.84	338	8.66
Cesarean section	39	56.52	1456	37.31
Instrument delivery	4	5.8	112	2.87
Fetal distress in labor	3	4.35	18	0.46
NICU admission	14	20.29	158	4.05
Neonatal death	3	4.35	10	0.26

Abbreviations: NICU: neonatal intensive care unit.

significantly increased the rates of preterm delivery, low birth weight or very low birth weight, low one- and five-minute Apgar scores, fetal death, LGA babies, meconium-stained amniotic fluid, Cesarean section and fetal distress in labor. In addition, the incidences of NICU admission and neonatal death in the polyhydramnios group were statistically higher than in the control group.

Differences that did not reach statistical significance included macrosomia (birth weight 4000 gm), cord looped around the neck, SGA babies and instrument delivery.

Discussion

The etiologic factors of polyhydramnios are varied and may include maternal and fetal conditions such as congenital anomalies, diabetes mellitus, isoimmunization, multiple gestations, and placental abnormalities [6-8]. But the cause of polyhydramnios remains idiopathic in most cases (60%) [7,8], and the precise incidence of associated perinatal outcomes is unclear because the definition of polyhydramnios, subjective impression, and quantitative deepest vertical pocket measurement influence the reported incidence of this entity. Adverse perinatal outcomes in patients with polyhydramnios have been associated with congenital fetal anomalies in numerous studies [13,14].

Despite a relative lack of data on patients with polyhydramnios without associated congenital fetal anomalies, many obstetricians still regard it as an indicator of an adverse outcome in pregnancy, and therefore recommend comprehensive invasive or noninvasive examinations to evaluate the risks of pregnancy. Although we excluded congenital fetal anomalies, our statistical analysis showed that polyhydramnios was more likely in women with preeclampsia, placental abruption, past history preterm labor, multiple pregnancy and primiparity. After control for these variables, there were increased risks of preterm delivery, low birth weight or very low birth weight,low one- and five-minute Apgar scores, fetal death,LGA babies, meconium-stained amniotic fluid,Cesarean section and fetal distress in labor. From this study, we could not identify a solitary etiologic factor for the adverse perinatal outcome in patients with polyhydramnios.The characteristic vasoconstriction in women with preeclampsia as a result of uteroplacental insufficiency has been hypothesized as a cause of oligohydramnios [15].

But polyhydramnios has rarely been associated with preeclampsia. The reason preeclampsia and polyhydramnios were associated in this study is probably due to the inclusion of multiple pregnancies in our series. Polyhydramnios carried approximately 5 times the risk of placental abruption in our series. Sheiner et al. reviewed 72,995 term deliveries and postulated that placental abruption was found to be significantly associated with polyhydramnios [16].

Joseph and Shoham reported diabetes was clinically associated with the occurrence of polyhydramnios [17,18]. From our current data, the association between polyhydramnios and diabetes was not statistically significant. Joseph et al.,from their reviews of 40,065 pregnant patients, found diabetic patients had a higher incidence of perinatal mortality and a higher rate of Cesarean section.On the contrary,

Shoham et al. suggested gestational diabetes complicated by polyhydramnios was not associated with increased risks of perinatal morbidity and mortality. Primiparity was also found to be a significant confounding factor affecting polyhydramnios in our series. Goldman et al. reported the incidence of polyhydramnios was not significantly different among grandmultiparous (five or more deliveries), primiparous and multiparous (two to three previous deliveries) women [19].

But our results did not support the above findings. This may be due to the high incidence of multiple pregnancies in patients with polyhydramnios in our study due to referral centre. Other studies ha e reported a higher maternal weight gain in multiple pregnancies [20].

But we dint check that in our sfudy.A higher rate of past history preterm delivery was also noted in patients with polyhydramnios. Detailed prenatal surveillance of the amount of amniotic fluid may be warranted in subsequent pregnancies for these patients.The prevalence of preterm delivery in polyhydramnios was higher than in the general population. But prematurity alone did not account for the adverse perinatal outcomes because the mean gestational age and fetal body weight for women with polyhydramnios were 36.92 ± 3.61, and 2837.70 ± 432.24 respectively. Several other underlying causes inducing polyhydramnios, rather than the relative excess of amniotic fluid, appear to be associated with adverse perinatal outcomes. Placental abruption and multiple pregnancies were the two major underlying causes of adverse perinatal outcome from our analysis (Table 2). Unlike oligohydramnios, polyhydramnios is rarely associated with fetoplacental dysfunction [15]. Therefore, polyhydramnios was not significantly associated with SGA neonates as in our study of oligohydramnios [21].

Sickler et al. evaluated 39 fetuses with polyhydramnios who were small for gestational age [22] and observed that major congenital anomalies were present postnatally in 92% (36 of 39) of fetuses and chromosome abnormalities were present in 38% (15 cases). Congenital anomalies and chromosomal abnormalities were the principal causes of SGA. We excluded congenital fetal anomalies in our initial criteria and this was possibly the main reason that polyhydramnios was not significantly associated with SGA babies. From our study, the prevalence of LGA neonates was 1.44 times greater in patients with polyhydramnios than in patients with normal amniotic fluid volume. A previous study relating polyhydramnios and the prevalence of LGA babies showed that patients with polyhydramnios have a significantly higher prevalence of LGA neonates (27%) than controls (10%)]23]. Results from our analysis support the above findings. In spite of the significant association between polyhydramnios and LGA babies, we did not observe an association between polyhydramnios and macrosomia. This finding was compatible with the lack of association between polyhydramnios and diabetes in our study.Furthermore, we also observed that patients with polyhydramnios carried a 2.18 higher risk of meconium stained amniotic fluid. But a previous report by Blackwell suggested meconium stained amniotic fluid does not appear to be associated with amniotic fluid amount in term pregnancies [24]. The difference was partially attributed to difficulties in quantitative assessment of meconium-stained amniotic fluid.

Based on data from a relatively small number of patients with idiopathic polyhydramnios, Panting-Kemp et al. reported polyhydramnios was not significantly associated with a greater risk of preterm delivery (<37 weeks), very low birth weight (<1500gm), 5-minute Apgar score <7, NICU admission or perinatal death [5]. But they found a significant difference in macrosomia and a higher incidence of Cesarean section, which were somewhat compatible with our findings. However, we observed that polyhydramnios had a significant association with preterm delivery, low and very low birth weight (<2500gm), low Apgar score <7, fetal death, LGA neonates, meconium-stained amniotic fluid, fetal distress in labor, NICU admission and neonatal death.

Even after exclusion of congenital anomalies, we found a three to six-fold risk of low Apgar score, fetal death, fetal distress in labor, NICU transfer and neonatal death in patients with polyhydramnios.This means that detailed antepartum fetal well-being surveillance, intensive intrapartum fetal monitoring, and further postpartum attention by a neonatologist are warranted in patients with polyhydramnios.

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