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Research Article

Pregnancy Outcome in Pregnant Women with Idiopathic Polyhydramnios

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Abstract

Background: Polyhydramnios is an excess of the amniotic fluid documented by quantitative ultrasonography. Over 40% of polyhydramnios are prenatally idiopathic and diagnosed with a particular abnormality postnatally; the majority of other cases remain unexplained. ***Objective***: To compare the maternal and neonatal outcomes of pregnancies with idiopathic polyhydramnios to pregnancies without polyhydramnios. ***Methods***: A retrospective case-control study involving 38 singleton pregnancies as cases and 65 as controls, outcomes concerning preterm delivery, mode of delivery, presence or absence of antepartum and postpartum hemorrhage, birth weight, weight for gestational age, Apgar score, fetal distress, neonatal intensive care unit (NICU) admission, stillbirth, and neonatal death were then compared. ***Results***: Cases showed a significantly higher preterm delivery rate (52.6% *vs*. 9.2%), cesarean section prevalence (76.3% *vs*. 23.1%), and maternal postpartum hemorrhage (PPH) (21.1% *vs*. 6.2%) compared to controls. Neonates from cases had significantly lower 1-minute (6.3 *vs*. 7.9) and 5-minute Apgar scores (8.0 *vs*. 9.0), more significant birth weight variability (3100 *vs*. 3240g), and higher rates of newborns large for gestational age (LGA) (23.7 *vs*. 1.5%), fetal distress (36.8 *vs*. 3.1%), and neonatal intensive care unit (NICU) admission (50.0 *vs*. 3.1%). Newborns being small for gestational age (SGA) prevalence (13.2 *vs*. 3.1%), stillbirths (5.3 *vs*. 3.1%), and neonatal deaths (7.9% *vs*. 1.5%) showed no significant differences. ***Conclusions***: Idiopathic polyhydramnios is associated with increased risks of preterm delivery, Cesarean section (CS) delivery, neonatal distress, and maternal hemorrhage, highlighting the need for vigilant prenatal care and availability of neonatal intensive care.

Keywords: Cesarean section, Fetal distress, Polyhydramnios, Postpartum hemorrhage.

نتائج الحمل لدى النساء الحوامل المصابات بالسلي المائي المتعدد مجهول السبب

الخلاصة

الخلفية: السلي المائي المتعدد هو فائض من السائل الأمنيوسي الموثق بواسطة التصوير بالموجات فوق الصوتية الكمي. أكثر من 40٪ من السلى مجهول السبب قبل الولادة ويتم تشخيصه بشذوذ معين بعد الولادة. ولا تزال غالبية الحالات الأخرى غير مفسرة. **الهدف**: مقارنة حصائل الأمهات والولادات من الحمل مع السلى المائي مجهول السبب مع الحمل بدون وجود السلى مجهول السبب. **الطرائق**: تمت بعد ذلك مقارنة دراسة حالات وشواهد بأثر رجعي شملت 38 حالة حمل فردية كحالات و 65 كشاهدات، والنتائج المتعلقة بالولادة المبتسرة، وطريقة الولادة، ووجود أو عدم وجود نزف قبل الولادة وما بعد الولادة، والوزن عند الولادة، والوزن بالنسبة لعمر الحمل، ودرجة أبغار، والضيق الجنيني، ودخول وحدة العناية المركزة لحديثي الولادة (NICU)، والإملاص، ووفيات الوليد. **النتائج**: أظهرت الحالات معدل ولادة مبكرة أعلى بشكل ملحوظ (52.6٪ مقابل 9.2٪) ، وانتشار العملية القيصرية (76.3٪ مقابل 23.1٪) ، ونزيف الأمهات بعد الولادة (21.1٪ مقابل 6.2٪) مقارنة بالمراقبات. كان لدى حديثي الولادة من الحالات درجات أبغار أقل بكثير في دقيقة واحدة (6.3 *مقابل* 7.9) و 5 دقائق (8.0 *مقابل* 9.0) ، وتباين أكثر أهمية في وزن الولادة (3100 *مقابل* 3240 جرام) ، ومعدلات أعلى لحديثي الولادة الكبار بالنسبة لعمر الحمل (23.7 مقابل 1.5٪) ، وضيق الجنين (36.8 مقابل 3.1٪) ، ودخول وحدة العناية المركزة لحديثي الولادة (50.0 مقابل 3.1% *NICU*). لم تظهر الفروق اليعتد بها الفروق ذات الفروق اليعتد بها في عدد الوفاء المنخفض بالنسبة لعمر الحمل، حيث كانت المواليد الجميض (5.3 مقابل 3.1 في المائة)، وفيات الولدان (7.9 في المائة مقابل 1.5 في المائة). **الاستنتاجات**: يرتبط السلى المائي مجهول السبب بزيادة مخاطر الولادة المبكرة والولادة القيصرية والضيق الوليدي والنزيف الأمومي، مما يسلط الضوء على الحاجة إلى الرعاية اليقظة قبل الولادة وتوافر العناية المركزة لحديثي الولادة.

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INTRODUCTION

Polyhydramnios is defined as an excess in the volume of the amniotic fluid documented by quantitative ultrasonography, like the Amniotic Fluid Index (AFI) 24 cm or single deepest pocket (SDP) 8 cm [1,2]. Clinically, polyhydramnios is suspected when the uterus is large for gestational age, as the fundal height test result in centimeters exceeds the current week of gestation by >3 [2,3]. Polyhydramnios can be mild, moderate, or severe, and it is associated with multiple prenatal, perinatal, and postnatal risks, including preterm delivery, malposition, placental abruption, and prolapsed cord [4]. The excess in amniotic fluid volume can be associated with various disorders; some tend to cause severe, risky polyhydramnios, like genetic abnormalities, syndromes, fetal anomalies, and hydrops fetalis [5,6]; others tend to cause milder polyhydramnios, such as idiopathic cases

[7], multiple gestations, maternal diabetes, and macrosomia [8,9]. Over 40% of polyhydramnios is prenatally idiopathic, which is defined as the absence of a prenatally diagnosed cause or known associated abnormality despite the presence of polyhydramnios [7]. Some of these idiopathic cases are diagnosed with a particular abnormality postnatally that could explain prenatal excess in amniotic fluid, such as Barter syndrome, fetal anemia, neuromuscular disorders, or infections (although it is rare for infectious pathologies to present with isolated polyhydramnios prenatally) [10-12]; the majority of other cases remain unexplained [13]. Despite its prevalence, idiopathic polyhydramnios remains a poorly explored condition in terms of prognostic outcomes and specific risks and severities compared to normal pregnancies and secondary cases, as well as the lack of diverse data from different geographical areas with different healthcare systems' points of view [14]. In the current study, the aim is to compare the obstetric and neonatal outcomes of pregnancies complicated with idiopathic polyhydramnios to a baseline of pregnancies with normal amniotic fluid volume to evaluate the association of this condition with adverse pregnancy outcomes in Kirkuk, Iraq, in order to provide a focused evaluation for this underexplored idiopathic condition from the point of view of the study region and participate in the worldwide literature advocacy for a closer surveillance for cases suffering from the severities distinguished and associated with this condition.

METHODS

Study design and setting

This retrospective case-control study involved a total of 103 singleton pregnancies presented to the study faculty at delivery: 38 cases of idiopathic polyhydramnios compared to 65 controls without polyhydramnios. Hospital records of both cases and controls were obtained and reviewed to compare the maternal and neonatal outcomes of pregnancies complicated with idiopathic polyhydramnios to control pregnancies in the matters of preterm delivery, mode of delivery, presence or absence of antepartum and postpartum hemorrhage, birth weight, weight for gestational age, Apgar score, fetal distress, NICU admission, stillbirth, and neonatal death. The reviewed records of the participants were obtained from the archives of the obstetrics and gynecology department in the study center from the 1st of January 2024 to the 1st of January 2025. Written informed consent was obtained from the patients and recorded in their files for participating in future studies. A convenient sampling technique was utilized in the current study; all cases with idiopathic polyhydramnios fulfilling the participation criteria and presented to the study faculty during the study period were reviewed for their case files and archives and then compared to controls presented during the study period.

Diagnostic criteria and devices

For cases diagnosed with idiopathic polyhydramnios, the criteria for diagnosis were based on several clinical and ultrasonographic findings concerning the amniotic fluid volume, including (I) Amniotic Fluid Index (AFI) ≥ 25 cm. (II) Deepest Vertical Pocket (DVP) ≥ 8 cm. (III) All measures are to be considered at a gestational age threshold of ≥ 34 weeks of gestation. (IV) Absence of any comorbidities that might result directly in polyhydramnios [15,16]. All ultrasonographic measurements recorded were done using the faculty ultrasound device ACUSON NX2™ (Siemens Healthineers, Erlangen, Germany) utilizing the CH5-2 Obstetric Transducer with a 1.4-5.0 MHz bandwidth.

Inclusion criteria

Adult female patients with singleton pregnancies presented at delivery and were diagnosed with idiopathic polyhydramnios based on the study's diagnostic criteria for the cases. For the control, normal singleton pregnancies that were not complicated by polyhydramnios presented at delivery.

Exclusion criteria

Females recorded refusing to participate in research studies, females with multiple gestations, and females with conditions associated with or resulting in polyhydramnios deeming it secondary, including pre-existing or gestational diabetes mellitus, carrying a fetus with structural or chromosomal abnormalities, Rh isoimmunization, and positive infectious screen.

Ethical considerations

The study protocol was approved by the Research Ethics Committee of the College of Medicine at the University of Kirkuk.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software, version 21.0. Descriptive statistics were calculated to summarize maternal and neonatal characteristics, including means and standard deviations (SD) for continuous variables and frequencies with percentages for categorical variables. Appropriate statistical tests were selected based on data type and distribution to compare outcomes between the case and control groups. For continuous variables, independent samples t-tests were used to compare means between groups; otherwise. For categorical variables, chi-square tests were employed to assess differences in proportions. A two-tailed significance level of $\alpha = 0.05$ was adopted for all tests. *p*-values less than 0.05 were considered statistically significant, indicating a difference between groups unlikely due to chance.

RESULTS

The current case-control study analyzed pregnancy outcomes in a total of 103 women, with 38 cases diagnosed with idiopathic polyhydramnios and 65 controls without polyhydramnios. The mean maternal age was 33.1 years with a standard deviation of 2.8 in cases, which is significantly higher than 29.2 years and a standard deviation of 2.1 in controls (p-value < 0.001). Parity ranged from 0 to 3, with 13 cases (34.2%) and 21 controls (32.3%) being primiparous, showing no significant difference (p-value= 0.83). Baseline characteristics are outlined in Table 1.

Table 1: Demographic Maternal and Neonatal Characteristics

Characteristic	Cases (n = 38)	Controls (n = 65)	p-value
Maternal age (year)	33.1±2.8	29.2±2.1	<0.001
Primiparous	13 (34.2)	21(32.3)	0.83
Gestational age (week)	36.0±1.8	38.4±1.3	<0.001
Infant weight (g)	3100±600	3240±400	0.09
Antepartum hemorrhage	3 (7.9)	1 (1.5)	0.13
Postpartum hemorrhage	8 (21.1)	4 (6.2)	<0.05

Values were expressed as frequency, percentage, and mean±SD. p-values derived from unpaired t-tests for continuous variables and chi-square test for parity. p-values derived from Fisher's exact test for APH (small numbers) and chi-square test for PPH.

The mean gestational age at delivery was 36.0 weeks with a standard deviation of 1.8 in cases, significantly lower than 38.4 weeks with a standard deviation of 1.3 in controls (p< 0.001), reflecting earlier delivery in the idiopathic polyhydramnios group. Among cases, polyhydramnios onset ranged from 28 to 34 weeks, with a mean of 30.9 weeks and a standard deviation of 1.6, with no clear correlation to gestational age at delivery (r = 0.12, p= 0.47). The mean infant birth weight was 3100 g with a standard deviation of 600 g in cases and 3240 g with a standard deviation of 400 g in controls, with a non-significant difference as lower weight in cases compared to controls (p= 0.09). Preterm delivery (< 37 weeks) was markedly more frequent in cases, occurring in 20 out of 38 women (52.6%), compared to 6 out of 65 controls (9.2%) (p< 0.001). Among preterm cases, the mean gestational age was 34.8 weeks with a standard deviation of 1.0, with 75% (15/20) delivering between 34 and 36 weeks, while preterm controls mean 36.2 weeks with a standard deviation of 1.9, as all 6 were between 35 and 37 weeks. Notably, 80% of cases with idiopathic polyhydramnios onset before 31 weeks (12/15) were delivered preterm, suggesting a potential association with early onset. The mode of delivery differed significantly between groups (p-value < 0.001), as cesarean sections (CS) were performed in 29 cases (76.3%), including 23 emergency (60.5%) and 6 elective (15.8%), compared to 15 controls (23.1%), with 5 emergency (7.7%) and 10 elective (15.4%) (Table 2) (Figure 1).

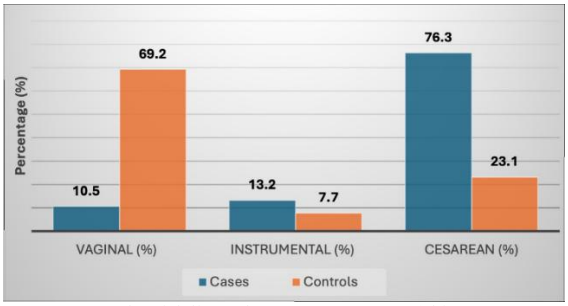

Figure 1: Mode of delivery by group. p< 0.001 (chi-square test).

Vaginal deliveries occurred in 4 cases (10.5%) versus 45 controls (69.2%), and instrumental deliveries in 5 cases (13.2%) versus 5 controls (7.7%). The predominance of emergency CS in cases (23/29 CS) was often linked to fetal distress or preterm labor, with 12 of 14 fetal distress cases resulting in emergency CS.

Table 2: Maternal and neonatal outcomes

Outcome	Cases (n = 38)	Controls (n = 65)	p-value
Preterm delivery (<37 weeks)	20(52.6)	6(9.2)	<0.001
Mode of delivery			
Vaginal	4(10.5)	45(69.2)	
Instrumental	5(13.2)	5(7.7)	
Cesarean section	29(76.3)	15(23.1)	<0.001
- Emergency CS	23(60.5)	5(7.7)	
- Elective CS	6(15.8)	10(15.4)	
Birth weight categories			
1500–2500 g	10(26.3)	2(3.1)	
2500–4000 g	22(57.9)	62(95.4)	<0.01
>4000 g	6(15.8)	1(1.5)	
LGA fetus	9(23.7)	1(1.5)	<0.001
SGA fetus	5(13.2)	2(3.1)	0.06
1-minute Apgar	6.3±1.1	7.9±0.9	<0.001
5-minute Apgar	8.0±0.9	9.0±0.7	<0.001
Fetal distress	14(36.8)	2(3.1)	<0.001
NICU admission	19(50.0)	2(3.1)	<0.001
Stillbirth	2(5.3)	2(3.1)	0.62
Neonatal death	3(7.9)	1(1.5)	0.13

Values were expressed as frequency, percentage, and mean±SD. p-values derived from chi-square tests. CS totals include both emergency and elective procedures. P-values derived from chi-square tests for categorical variables, t-tests for Apgar scores, and Fisher's exact test for stillbirth and neonatal death due to small numbers.

In contrast, control CS was primarily elective, indicating fewer acute complications. Birth weight distribution varied significantly between cases and controls (p< 0.01), with 10 cases (26.3%) in the 1500–2500 g range versus 2 controls (3.1%), 22 cases (57.9%) versus 62 controls (95.4%) in the 2500–4000 g range, and 6 cases (15.8%) versus 1 control (1.5%) exceeding 4000 g (Table 2) (Figure 2).

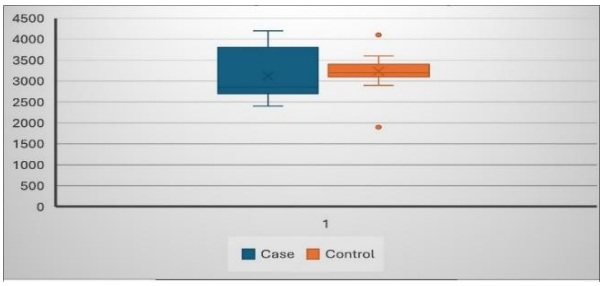

Figure 2: Infant birth weight distribution by group. p= 0.09 (t-test).

Large-for-gestational-age (LGA) fetuses were identified in 9 cases (23.7%) and 1 control (1.5%) (p-value < 0.001), while small-for-gestational-age (SGA) fetuses occurred in 5 cases (13.2%) versus 2 controls (3.1%) (p= 0.06). Neonatal outcomes showed significant differences (Table 2) (Figure 3).

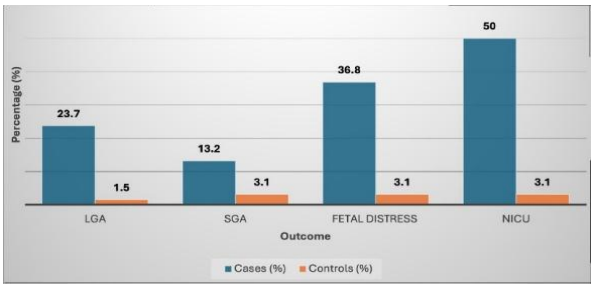

Figure 3: Neonatal outcomes by group. p< 0.001 (LGA, Fetal Distress, NICU), p= 0.06 (SGA).

Mean 1-minute Apgar scores were 6.3 with a standard deviation of 1.1 in cases versus 7.9 with a standard deviation of 0.9 in controls (p< 0.001), improving to 8.0 with a standard deviation of 0.9 versus 9.0 with a standard deviation of 0.7 at 5 minutes (p< 0.001). Notably, 34.2% of cases (13/38) had 1-minute Apgar scores ≤6, compared to 1.5% of controls (1/65), indicating greater initial distress. Fetal distress was documented in 14 cases (36.8%) versus 2 controls (3.1%) (p< 0.001), with 10 of 14 cases with fetal distress occurring in preterm deliveries. NICU admission was required for 19 cases (50.0%) versus 2 controls (3.1%) (p< 0.001), predominantly among preterm case infants (17/19), reflecting increased neonatal morbidity. Stillbirths occurred in 2 cases (5.3%) and 2 controls (3.1%) (p= 0.62), with case stillbirths at 34 and 35 weeks and control stillbirths at 35 and 37 weeks. Neonatal deaths were recorded in 3 cases (7.9%) versus 1 control (1.5%) (p= 0.13), with case deaths linked to preterm delivery (34-35 weeks) and low Apgar scores (5-7 at 5 minutes). The control neonatal death occurred at 35 weeks with a 5-minute Apgar of 5. Antepartum hemorrhage (APH) affected 3 cases (7.9%) versus 1 control (1.5%) (p= 0.13). Postpartum hemorrhage (PPH) was significantly more frequent in cases, occurring in 8 of 38 (21.1%) versus 4 of 65 controls (6.2%) (p< 0.05). In cases, 5 of 8 PPH followed CS (4 emergencies, 1 elective), while control PPH were evenly split between vaginal and CS deliveries. Maternal complications are detailed in Table 1. Among cases, idiopathic polyhydramnios onset before 31 weeks was associated with a higher preterm delivery rate (80% vs. 43% for onset ≥31 weeks), though this finding was not statistically significant (p= 0.09). Maternal age and parity showed no significant influence on preterm delivery, CS rates, or neonatal outcomes within either group (p> 0.05). The higher emergency CS rate in cases with fetal distress (85.7%, 12/14) versus controls (50%, 1/2) further highlights the acute nature of complications in idiopathic polyhydramnios pregnancies.

DISCUSSION

The current case-control study of 103 singleton pregnancies, from which 38 cases were described as having idiopathic polyhydramnios after the exclusion of cases with secondary polyhydramnios, and 65 pregnant ladies without idiopathic polyhydramnios were described as controls to compare and contrast several demographic, neonatal, and maternal outcomes. The current study reveals a significant association between idiopathic polyhydramnios and preterm delivery, cesarean section delivery, neonatal distress, NICU admission, and PPH. Moreover, significant trends toward increased perinatal mortality and lower birth weight were observed. Analysis of the demographic data in the current study reveals that idiopathic polyhydramnios is significantly more common in older women, with a mean of 33.1 years in cases versus 29.2 years in controls (p-value < 0.001). This is in agreement with multiple studies that showed a relationship between idiopathic polyhydramnios and rising maternal age and parity [17]. However, this is in contrast with other studies [15]. On analyzing parity status of cases and controls, it is found that 34.2% of cases are primiparous and 32.3% of controls are primiparous, with a p-value of 0.83. This is in contrast to previous studies [17]. One reason for this difference could be because of the current study's relatively small sample size. This study identified a statistically significantly higher preterm delivery rate in cases (52.6%) as compared to controls (9.2%), with a p-value of < 0.001, with a mean gestational age at delivery being 36.0 weeks in cases versus 38.4 weeks in controls (p< 0.001). This disparity underscores a higher preterm risk in idiopathic polyhydramnios, particularly at earlier gestations. These findings corroborate a recent systematic review and meta-analysis by Kechagias *et al*. in 2024 [4], which reported a pooled risk ratio (RR) of 1.96 (95% CI 1.35-2.86) for preterm birth in idiopathic polyhydramnios, based on fifteen studies. The authors attributed this risk to uterine overdistension, potentially triggering preterm labor as well as preterm premature rupture of membranes (PPROM) in six other studies [4]. Similarly, a recent review article by Whittington *et al*. in 2024 [18] reported that preterm delivery rates increase with polyhydramnios, though their review included both idiopathic and secondary polyhydramnios, limiting direct comparability to the current study findings. On the other hand, Khan *et al*. in 2017 [15] found no significant difference in preterm delivery between idiopathic polyhydramnios and controls with a reported p-value of 0.233 in a cohort of 144 cases, possibly due to a milder polyhydramnios threshold or earlier intervention in contrast to the current study. The earlier mean gestational age at polyhydramnios onset in cases (30.9 weeks) and its association with preterm delivery in 80% of cases diagnosed before 31 weeks (p= 0.09) suggest a temporal relationship between them. This aligns with Sgayer *et al*. in 2024 [19], who observed that earlier

polyhydramnios onset correlates with adverse outcomes, potentially due to prolonged uterine stress or other fetal factors. However, the exclusion of congenital anomalies and maternal diabetes in the current study strengthens the idiopathic etiology, suggesting that uterine mechanical factors alone may drive preterm labor in cases. The prevalence of CS in cases is 76.3% *vs*. 23.1% in controls ($p< 0.001$), predominantly emergency CS (60.5% *vs*. 7.7%), reflecting a significant operative burden in idiopathic polyhydramnios. This is consistent with Kechagias *et al*. [4], who reported an RR of 1.60 (95% CI 1.39–1.84) for CS, and Pagan *et al*. [20] in 2023, who found an odds ratio (OR) of 2.31 (95% CI 1.79–2.99) in a meta-analysis of twelve studies. Both studies linked CS delivery to fetal malpresentation and distress, reflecting the findings in the current study, where 85.7% of fetal distress cases in the polyhydramnios group necessitated emergency CS. Furthermore, Whittington *et al*. [18] noted in their study that CS delivery rates vary with polyhydramnios severity, as the rate increases with polyhydramnios severity; however, the current study lacks severity stratification, suggesting even mild to moderate idiopathic polyhydramnios cases carry the risk. Similarly, Zeino *et al*. [21] in 2017 reported a higher CS delivery rate (37.2% vs. 3.5%, p-value < 0.05) in idiopathic polyhydramnios, with prolonged labor as a key driver rather than fetal distress. Neonatal birth weight in cases showed a greater variability of 3100 ± 600 g versus 3240 ± 400 g in controls, with a p-value of 0.09. The wider range in cases (2400–4200 g) versus controls (1900–4200 g) suggests greater variability, potentially linked to polyhydramnios-related growth disturbances. Cases also showed a higher prevalence of large-for-gestational-age (LGA) infants (23.7%) versus controls (1.5%) with a p-value < 0.001. Moreover, cases had a trend toward small-for-gestational-age (SGA) infants more than controls (13.2% *vs*. 3.1%) with a p-value of 0.06. This bimodal distribution aligns with Pagan *et al*. [20], who reported an OR of 2.93 (95% CI 2.39–3.59) for macrosomia, and Kechagias *et al*. [4], who noted increased risks for both LGA and SGA fetuses. The higher LGA prevalence in cases aligns with idiopathic polyhydramnios-related overgrowth, while the trend toward more SGA infants suggests possible growth restriction in some cases. The LGA finding may reflect fetal overgrowth due to altered amniotic fluid dynamics, as suggested by Wax *et al*. [22], who linked persistent polyhydramnios to birth weights over 4500 g (OR 2.8, 95% CI 1.2–6.5). The SGA trend, though not significant (p-value = 0.06), warrants attention. In 2022, Walter *et al*. [3] reported a poor prognosis for polyhydramnios cases with SGA fetuses, often tied to aneuploidies. However, the exclusion of chromosomal anomalies in the current study suggests alternative mechanisms, such as placental insufficiency masked by excess fluid. In contrast, Khan *et al*. [15] found no difference in low birth weight ($p> 0.05$), possibly due to a smaller sample or different polyhydramnios criteria. The current study highlights the need for further research into fetal growth patterns in idiopathic polyhydramnios, as these may signal fetal compromise. Neonates from cases exhibited statistically significantly lower Apgar scores compared to controls, higher fetal distress, and NICU admission rates. These findings align with Kechagias *et al*. [4], who reported an RR of 3.0 (95% CI 1.23–7.35) for low 5-minute Apgar scores and an RR of 1.62 (95% CI 1.11–2.37) for NICU admission. Pagan *et al*. [20] similarly noted an OR of 2.21 (95% CI 1.34–3.62) for low Apgar scores, attributing this to intrapartum hypoxia from uterine overdistension or cord compression. Stillbirths and neonatal deaths were more frequent in the cases group, although not statistically significant; these events suggest a trend toward higher perinatal risk in idiopathic polyhydramnios. However, these rates exceed those in the Pagan *et al*. study (OR 7.64 for intrauterine fetal demise, 95% CI 2.50–23.38; OR 8.68 for neonatal death, 95% CI 2.91–25.87), suggesting a higher-risk cohort in the current study [20]. Kechagias *et al*. [4] reported an RR of 4.75 (95% CI 2.54–8.86) for stillbirth, reinforcing the perinatal mortality risk. Maternal postpartum hemorrhage (PPH) was significantly higher in cases (21.1%) compared to controls (6.2%), with a p-value < 0.05. These results are consistent with Kechagias *et al*. [4], who linked PPH to uterine atony from overdistension by polyhydramnios, as they reported an RR of 1.98 with a 95% CI of 1.22-3.22. Similarly, Whittington *et al*. [18] also noted increased PPH in polyhydramnios, though their review included non-idiopathic cases. Antepartum hemorrhage (APH) showed no significant difference between cases and controls. This is in contrast with Kechagias *et al*. [4], who reported an RR of 3.20, with a 95% CI of 2.20-4.65 for placental abruption as an APH, possibly due to the smaller sample or exclusion of severe polyhydramnios cases in the current study. The association of PPH with CS delivery (5/8 cases) in this study suggests a compounded risk from operative delivery, as 5 out of 8 cases had PPH post-CS in polyhydramnios. This finding is also reported by Zeino *et al*. [21], who noted higher PPH rates post-CS in polyhydramnios. This highlights the need for active postpartum management in these high-risk pregnancies. However, a recent study conducted by Lerner *et al*. [23] in 2024 found no increased PPH with term induction in mild polyhydramnios cases, contrasting the current study's high CS delivery rate, which may be due to differing management protocols or polyhydramnios severity thresholds used. However, the discrepancy in labor-management protocols and population characteristics, such as parity, showed no significant effect in this cohort (p-value = 0.83). The high emergency CS rate in this study underscores the need for intrapartum monitoring, particularly given the association with fetal distress in cases (36.8%) compared to controls (3.1%), p-value < 0.001. The systematic review by Pagan *et al*. [20] and

Kechagias *et al*. [4] provides robust benchmarks, yet the higher rates of NICU admission and PPH in this study may reflect a more vulnerable cohort or regional practice variations, such as lower thresholds for intervention. The increased risk of preterm delivery, CS delivery, fetal distress, NICU admission, and PPH in the current study underscores the need for antenatal and intrapartum monitoring in idiopathic polyhydramnios cases, as suggested by the Society for Maternal-Fetal Medicine [24]. While the association between polyhydramnios and risky outcomes is well established and studied, a considerable amount of evidence available focuses on polyhydramnios in general rather than isolating idiopathic polyhydramnios that lacks solid etiology but still carries a high risk of adverse outcomes, as done in the current study; this adds additional insight for clinicians encountering idiopathic cases on the possible existence of risks and adverse events rather than being completely the so-called "benign" idiopathic presentation. Moreover, the current findings derived from a single center in the Kirkuk region in Iraq reflect the presence of a population-specific burden and might enhance the local practices towards more tailored rather than uniform management approaches for complicated cases of idiopathic polyhydramnios.

Study limitations

Limitations include the small sample size (n = 103), which may underpower the detection of rare events like stillbirth, and the lack of polyhydramnios severity stratification (mild, moderate, severe), which could refine risk profiles as shown by Wiegand *et al*. [25] in 2016. Single-center data may limit generalizability, and unmeasured confounders (e.g., maternal BMI and socioeconomic status) could influence outcomes. Future studies should employ larger and multicenter cohorts.

Conclusion

Idiopathic polyhydramnios is associated with significant maternal and neonatal risks, aligning with recent literature while highlighting unique cohort-specific burdens. These findings advocate for tailored obstetric care, balancing vigilance with reassurance in milder cases, and call for further research to optimize management strategies.

Conflict of interests

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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