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Perinatal Outcomes of Idiopathic Polyhydramnios with Normal Ultrasound: A Systematic Review and Meta-Analysis

Samiyeh Kazemi[1], Farin Soleimani[2], Sara Kazemi[3], Anoshirvan Kazemnejad[4], Zahra Kiani[1], *Farzaneh Pazandeh[5], Nasrin Azimi[1]

[1]PhD Student of Reproductive Health, Student Research Committee, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [2]Associate Professor/MD, Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran. [3]MSc Student of Health Education, Department of Health Education & Health Promotion, Faculty of Medical Science, Tarbiat Modares University (TMU),Tehran, Iran. [4]Professor of Biostatistics, Department of Biostatistics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran. [5]Assistant Professor, Midwifery and Reproductive Health Research Center, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract

Background: Incidence of polyhydramnios in various studies has been reported from 0.2 to 3.9%. Approximately, 50-60% of cases are idiopathic with no known etiology. We aimed to investigate perinatal outcomes of idiopathic polyhydramnios with a normal ultrasound.

Materials and Methods: In this study, Persian and English databases including Barakatkns, SID, Magiran, Medline, Science Direct, Scopus, Cochran, Embase, and ProQuest were searched for articles published from 1950 to August 2018. The search procedure was conducted with keywords related to "idiopathic polyhydramnios", "perinatal outcomes", "normal ultrasound", and their equivalents in "Mesh" and PICO. In meta-analysis, first we quantified heterogeneity by using I^2 statistics and tested using the Cochran's Q test. Even when a low heterogeneity was detected, a fixed-effects model was applied, and for more than 75% of heterogeneity, random-effects model was used. The Forest Plot chart was drawn up and the relative risk (RR) estimate for each study (ES), the pooled estimate of "RR" by combining all the studies and its 95% CI, and the P-value associated with it, were indicated.

Results: In this study, 13 articles involving 325,426 pregnant women were included for the Meta-analysis. The RR and 95% CI of Caesarian Section (C.S), 1.61(1.25-2.07), macrosomia, 1.84(1.40-2.42), preterm delivery, 2.45(1.29-4.64), NICU admission, 2.90(1.77-4.74), Apgar score min 5 <7, 2.79(1.18-6.57), fetal distress, 1.69(1.02-2.80), and large for gestational age (LGA), 2.27(1.38-3.72), were determined. We found a higher RR of perinatal outcomes including NICU admission, Apgar score min 5<7, preterm delivery, and LGA. RR other perinatal outcomes such as macrosomia, fetal distress, and C.S. were lower.

Conclusion: Idiopathic Polyhydramnios was significantly associated with adverse perinatal outcomes. Intensive intrapartum monitoring and further attention in the postpartum are warranted.

Key Words: Idiopathic-polyhydramnios, Meta-analysis, Normal ultrasound, Perinatal outcome.

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Corresponding Author:

Farzaneh Pazandeh, Assistant Professor, Midwifery and Reproductive Health Research Center, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Email: Pazandehf@sbmu.ac.ir

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1- INTRODUCTION

Polyhydramnios is present in approximately 2% of pregnancies. The overall incidence of polyhydramnios irrespective of etiology ranges in various studies from 0.2 to 3.9% (1, 2). Approximately, 50-60% of cases are idiopathic with no known etiology (3). The amniotic fluid index (AFI) technique defines hydramnios as an amniotic fluid index (AFI) of ≥ 24 cm or ≥ 25 cm, which respectively is ≥ 95, and ≥ 97.5% in normal singleton pregnancies. Also, the single deepest pocket (SDP) is ≥ 8; or the examiner's subjective assessment of having an increased amount of amniotic fluid volume (1). Idiopathic-polyhydramnios is defined as disorders that are not associated with factors such as maternal diabetes, isoimmunization, fetal infection (Cytomegalovirus [CMV], or toxoplasmosis), placental tumors, multiple gestations, or fetus related anomalies in singleton pregnancies (e.g., central nervous system or gastrointestinal anomalies, aneuploidy, other structural anomalies, and hydrops) that can result in polyhydramnios (1, 4-7).

Polyhydramnios has previously been associated with an increased risk of a number of perinatal morbidity and mortality, such as preterm birth, aneuploidy, cesarean section, fetal anomalies, and perinatal and postnatal mortality (4-12). Pregnancy complicated by polyhydramnios can present diagnostic and therapeutic dilemmas for obstetricians. Many clinicians have viewed polyhydramnios as a prognostic factor of increased risk of pregnancy complications and have recommended an extensive evaluation of these pregnancies (9, 10, 13). In contrast to earlier reports, the correlation of idiopathic hydramnios with adverse perinatal and childbirth outcomes has been less consistent in more recent investigations. In the present review, idiopathic hydramnios is defined as hydramnios without ultrasonographically identifiable fetal anomalies or placental tumors, the absence of preexisting or gestational diabetes, no fetal infections, no evidence of fetal/maternal hemorrhage or isoimmunization, and no fetal chromosomal abnormalities (5-7). Idiopathic polyhydramnios is a matter of debate in obstetric practice, as perinatal outcomes idiopathic polyhydramnios is conflicting in literature. The aim of this systematic review and meta-analysis was to investigate the perinatal outcomes of idiopathic polyhydramnios and to evaluate whether it is associated with adverse events.

2- MATERIALS AND METHODS

This systematic review and Meta-Analyses was performed according to the Preferred Reporting Items for Systematic Reviews (PRISMA) checklist (14).

2-1. Inclusion and Exclusion Criteria

2-1-1.Types of participants

This systematic review considered studies that focused on women with singleton pregnancy, women with idiopathic polyhydramnios and normal sonography in hospital, or as part of the team of participants in the interventions in a simulated hospital environment.

2-1-2. Types of interventions

We focused primarily on perinatal, and childbirth outcomes in singleton pregnancy women. So we evaluated the effect of idiopathic hydramnios on perinatal outcome in uncomplicated pregnancies between 37 weeks, 0 days and 41 weeks, 6 days of gestation.

2-1-3. Types of studies

This systematic review considered observational studies designs including cross-sectional, studies, descriptive studies, before and after studies, prospective and retrospective cohort

studies, and case-control studies, related to the perinatal outcome for inclusion.

2-1-4. Types of outcomes

This systematic review considered studies that included the following outcomes: (1) perinatal outcomes, (2) neonatal outcomes, (3) peripartum outcomes.

2-2. Search Strategy

The first step was to use the words contained in the review title to do a scoping of the titles and abstracts in the related literature in different electronic databases. The relevant key words according to population, intervention, comparison, outcome (PICO) were then identified from the medical subject headings (Mesh) function in PubMed. By using key words and index terms, a systematic search was taken through 'OR' and 'AND', including those shown in (**Table.1**), 'PICO Key words' below and Search keywords in PubMed database (**Box.1**). Databases including Barakatkns, SID, Magiran, Medline (via PubMed), Science Direct, Scopus, Cochran, Embase, ProQuest, and also Google Scholar were searched for the relevant articles. Observational studies (cross-sectional, case-control, descriptive, cohort studies) in the English and Persian language from 1950 to the end of August 2018 were included for this research. Clinical trials, letters to the editor, review studies, and studies in other languages were excluded from the study.

Table-1: PICO key words (P=population, I=intervention, C=context, O=outcome)

P	I	C	O
Singleton pregnancy women	Effect of idiopathic hydramnios on perinatal outcome.	Pregnancy	Perinatal outcomes
Women with idiopathic polyhydramnios		Childbirth	Neonatal outcomes
			Peripartum outcomes

Box -1. Search keywords in PubMed database.

A full electronic search strategy for PubMed was applied using: Idiopathic-polyhydramnios [tiab] OR Polyhydramnios [tiab] OR Hydramnios [tiab] OR Hydramnios idiopathic [tiab] AND Pregnancy [tiab] OR Childbirth outcome [tiab] OR Birth outcome [tiab] OR Perinatal outcome [tiab].

2-3. Study Selection

After an initial review of retrieved articles and removing duplicate and irrelevant ones, a manual search was conducted in the reference list of the articles entered. Screening of the articles was conducted in three stages independently by two of the authors (S.K and F.P). In the first stage, studies were selected based on their titles and abstracts. In the second stage, the full text of the articles was assessed for the relevant keywords. In the third stage articles, information, and statistical analyses were extracted. Disagreement among the researchers was resolved by expert consensus.

2-4. Risk of Bias Assessment

We assessed the risk of bias using the criteria outlined in the Newcastle-Ottawa scale for assessing the quality of nonrandomized studies (15). Two

parameters related to risk of bias were assessed in each included study: the selection of the study, and the measured outcome. Each parameter consists of subcategorized questions: selection (n = 4), and outcome (n = 2). Stars awarded for each item serve as a quick visual assessment for the methodological quality of the studies. A study can be awarded a maximum of 9 stars, indicating the highest quality. Studies were classified as 'low risk' of bias when scoring ≥ 6 stars, while 'high risk' of bias received < 6 stars. Qualitative assessment based on Newcastle-Ottawa Scale (NOS) showed that 13 studies were low risk of bias. Quality assessment was not used as an exclusion criterion. The risk of bias in each study included was assessed individually by two reviewers (F.P and S.K). Any differences in opinion regarding the assessment of the risk of bias were resolved by discussion.

2-5. Data Extraction

Data were extracted independently by two authors (Z.K and N.A). An information checklist for research papers consisted of corresponding authors, year of publication, and the country where the study was carried out. General information including the sample size, type of articles, purpose and results of the study, including perinatal outcomes of idiopathic-polyhydramnios (caesarean section [CS], Neonatal Intensive Care Unit [NICU], Large-for-Gestational-Age [LGA], Macrosomia, Preterm delivery, Apgar score min 5<7, Fetal distress, etc.) were extracted. In case of any disagreement, discussions were held to reach consensus. Studies were excluded if they presented insufficient data, if they were mere reviews, and if they were not observational studies.

2-6. Statistical analysis

In this study, the relative risk (RR) in the meta-analysis was investigated. To combine the results of various studies, and also to consider heterogeneity. In this meta-analysis, at first we quantified heterogeneity by using I^2 statistics, and tested using the Cochran's Q test. A random effect model and a fixed effect model were used appropriately according to the significance of the heterogeneity test. When I^2 was ≤25%, studies were regarded as homogeneous, and the fixed effect model was used. When I^2 was ≥75% (as in outcomes C.S., Apgar score < 7 at 5 min, admission to the NICU, Preterm delivery, Fetal distress, and LGA), a random effect model was used. Then, the Forest Plot chart was drawn up and the RR estimate for each study (ES), its 95% confidence interval (95% CI), the pooled estimate of "relative risk" by combining all the studies and its 95% CI, and the probability value (P-value) associated with it were indicated. Whether the "RR" estimate obtained from the combination of all studies has a significant difference with a single study is reported in the tables.

We explore publication bias with standard statistical tests, Begg and Egger using "metafunnel" and "metabias" command in STATA software. To perform the meta-analysis, STATA software version 14.0, and the metan command were used. The P-value less than 0.05 was considered as statistically significant. Post hoc sensitivity analyses were conducted to investigate the potential sources of heterogeneity from specific studies that may have biased the analyses. We conducted sensitivity analyses to explore the effects of study quality and effect of size on the results.

3- RESULTS

In this study, 1,638 articles were identified through database searching, of which 406 articles were removed because they were duplicate; 1,169 articles were removed due to irrelevancy, lack of full text, and not meeting the criteria, and being clinical trials, review articles, and written in languages other than English

and Persian; and 52 articles were removed because they lacked the inclusion criteria. Finally, after exclusion of articles without inclusion criteria, 13 studies were included in this review (**Figure.1**). Considering all the included studies, the total sample size of studies was 325,426 pregnant women. A total of 13 articles (5 observational and 8 cohort studies) were included. Thirteen articles were carried out in different countries such as the United States (2), Turkey (2), Israel (2), The Netherlands (1), Ireland (1), Egypt (1), India (1), Qatar (1), Pakistan (1), and Southeast Asia countries like Taiwan (1) (**Table.2**). **Table.3** presents the risk of bias in each included study using the Newcastle-Ottawa scale. All of the 13 studies included in the Meta-Analysis were judged to be of medium-high quality with a low risk of bias **(Table.3)**. We show the results of Begg and Egger tests in table "Begg and Egger table". There is no evidence of publication bias. According to Begg's test the assumption of publication bias was rejected for all of the outcomes (**Table.4)**.

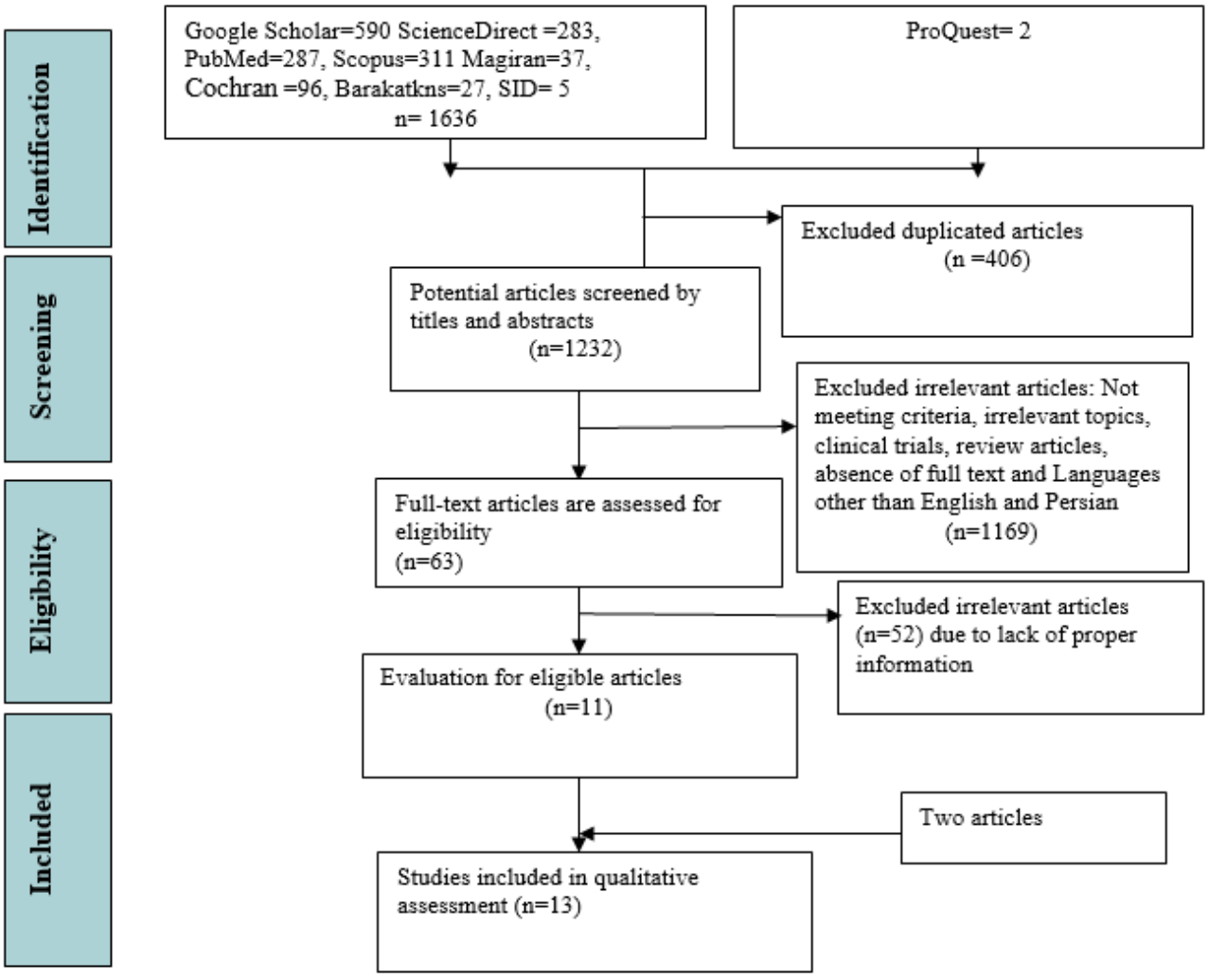

Fig.1: PRISMA flowchart of present study.

Table-2: The characteristics of studies included in the meta-analysis of outcomes of idiopathic-polyhydramnios with normal ultrasound

First Author (Reference), year	Country	Study design	Objective	Sample size*	Idiopathic-polyhydramnios	Control group	Outcomes assessed
Sarwat Khan and Donnelly (3), 2017	Ireland	Cohort	Outcome of pregnancy in women diagnosed with idiopathic polyhydramnios	288	144 singleton pregnant with idiopathic polyhydramnios	144	Preterm deliveries, low birth weight, low Apgar score at 1 min and 5 min, perinatal mortality, caesarean delivery, fetal distresses, neonatal intensive care unit (NICU) admissions.
Yefet, Daniel-Splegel (12), 2017	Israel	Cohort	Outcomes from Polyhydramnios with normal ultrasound	402	134 Children aged 4 to 9 years with polyhydramnios and normal detailed ultrasound examination during pregnancy	268	Malformations, obstetrics outcomes, genetic syndromes, neurodevelopment.
Karahanoglu et al. (21), 2016	Turkey	Cohort	Intrapartum, postpartum characteristics and early neonatal outcomes of idiopathic polyhydramnios	543	207 women with idiopathic polyhydramnios	336	Preterm birth, caesarean section newborn resuscitation, admission to neonatal intensive care unit (NICU), structural anomalies.
Al-Ibrahim et al. (28), 2015	Qatar	Cohort	Antenatal idiopathic polyhydramnios: then what?	180,000	66 women with idiopathic polyhydramnios	179,934	Preterm delivery, IUFD, Caesarean section, low APGAR score admission to NICU and neonatal complications.
Abbas et al. (4), 2015	Egypt	Cohort	Does Polyhydramnios in singleton pregnancies has effect on perinatal outcome in absence of congenital fetal anomalies	242	152 singleton pregnancies with polyhydramnios	90	Preterm delivery, low birth weight, very low birth weight, macrosomia, 1 and 5 min APGAR scores < 7, small for gestational age (SGA, large for gestational age (LGA), C-section rates, fetal distress, admission to neonatal intensive care unit (NICU) after delivery and neonatal death within the first 7 days.
Lallar et al. (22), 2014	India	Case-control	Perinatal Outcome in Idiopathic Polyhydramnios	1,000	500 women with idiopathic polyhydramnios	500	Normal vaginal delivery, preterm deliveries, perinatal mortality.
Sadaf et al. (23), 2013	Pakistan	Descriptive	Perinatal outcome in explained and unexplained polyhydramnios	95	50 women with singleton pregnancies with idiopathic polyhydramnios	45	Preterm delivery, low birth weight, macrosomia, malpresentations, APGAR score at 5 min < 7, rate of caesarean section, neonatal hospitalization, congenital anomalies and perinatal death.
Taskin et al. (20), 2013	Turkey	Cohort	Perinatal outcomes of idiopathic polyhydramnios	160	59 singleton pregnancies with idiopathic polyhydramnios	101	Preterm delivery, gestational age at birth, low birth weight, very low birth weight (macrosomia, 1 and 5 min APGAR scores < 7, small for gestational age (SGA) fetuses, large for gestational age (LGA) fetuses, C-section rates, number of fetal distress, admission to neonatal intensive care unit (NICU) after delivery, neonatal death within the first 7 days, and deaths before the age of 1 year.
Dorleijn et al. (11), 2009	Netherlands	Cohort	Idiopathic polyhydramnios and postnatal findings	88	88 women with idiopathic polyhydramnios	0	the onset of polyhydramnios and ultra-sonographic evidence of macrosomia
Chao Chen et al. (19), 2005	Taiwan	Cohort	Perinatal outcomes of polyhydramnios without associated congenital fetal anomalies after the gestational age of 20 weeks	44,657	279 women who had babies without associated fetal anomalies after the gestational age of 20 weeks	44,478	Preterm delivery, low birth weight or very low birth weight, low 1 and 5 min Apgar scores, fetal death, large for gestational age babies, meconium stained amniotic fluid, Cesarean section, fetal distress in labor, NICU transfer and neonatal death.
Panting-Kemp et al. (2), 1999	USA	Cross sectional	Idiopathic polyhydramnios and perinatal outcome	453	151 women with singleton pregnancies	302	Preterm delivery, low birth weight, macrosomia, malpresentation at delivery, rate of cesarean delivery, Apgar score at 5 min < 7, admission to the neonatal intensive care unit, and perinatal death.

Biggio et al. (10), 1999	USA	Case-control	Hydramnios Prediction of Adverse Perinatal Outcome	36,796	370 women with singleton pregnancies	36,426	Perinatal death, anomaly rate, fetal growth restriction (FGR), cesarean delivery.
Maymon et al. (29), 1998	Israel	Cross sectional	Isolated hydramnios at term gestation and the occurrence of peripartum complications	60,702	1211 patients with singleton gestation who delivered at term	59,491	Cesarean section, antepartum death, postpartum death, Abruptio placentae, fetal distress, meconium stained amniotic fluid, low Apgar score at 5 min, malpresentation, clinical chorioamnionitis prolapse of cord and Large for gestational age infant (LGA).

* Singleton pregnant women.

The RR and 95% CI were calculated for each of the studies. Hence, the random effects model was used for the meta-analysis. **Figures 2-8** present the RR, 95% CI, and I^2 for each of the studies. Perinatal outcomes with RR and 95% CI included C.S., 1.61(1.25-2.07), I^2=94.1%, macrosomia, 1.84 (1.40-2.42), I^2= 2.2%,, preterm birth, 2.45 (1.29-4.64), I^2= 85.6%, NICU admission, 2.90 (1.77-4.74), I^2= 79.6%, Apgar score min 5<7, 2.79 (1.18-6.57), I^2= 85.9%, fetal distress, 1.69 (1.02-2.80), I^2=83.9%, and Large for Gestational Age (LGA), 2.27 (1.38-3.72), I^2=84.4%. Total C.S. rates were significantly higher in the Idiopathic-Polyhydramnios (IP) group compared with the normal atrial fibrillation (AF) group (p=0.000). Similar significant associations were found with the Apgar score <7 at 5 min (p=0.000), as well as with admission to the NICU (p=0.000), Macrosomia (p=0.267), Preterm Delivery (p=0.000), Fetal distress (p=0.000), and LGA (p=0.000). So the meta-regression data showed that there was a higher RR of the outcomes; i.e., NICU admission (RR: 2.9), Apgar scores min 5 < 7 (RR: 2.7), preterm birth (RR: 2.4), and LGA (RR: 2.2). The RR of other consequences such as Macrosomia (RR: 1.8), fetal distress (RR: 1.6), and C.S. (RR: 1.6) were lower.

Table-3: Assessing the risk of bias a Newcastle-Ottawa scale for assessing the quality of nonrandomized studies in Systematic Review and Meta-Analysis.

Author (Reference) Year	Selection				Outcome		Total Score
	Representative	Sample Size	Non-respondents	Ascertainment	Assessment of the outcome	Statistical test	
Khan and Donnelly (3) 2017	*	*	*	**	*	*	7*
Yefet and Daniel-Spiegel (12) 2017	*	*	*	**	*		6*
Karahanoglu et al. (21) 2016	*	*	*	**	*	*	7*
Al-Ibrahim et al. (28) 2015	*	*		**	*		6*
Abbas et al. (4) 2015	*	*		**	*	*	6*
Lallar et al. (22) 2014	*	*		**	*	*	6*
Sadaf (23) 2013	*	*		**	*	*	6*
Taskin et al. (20) 2013	*	*	*	**	*	*	7*

Drleijn et al. (11) 2009	*	*	*	**	*	*	7*
Chen et al. (19) 2005		*		**	*	*	6*
Panting-Kemp et al. (2) 1999	*	*	*	**	*	*	7*
Biggio et al. (10) 1999	*	*		**	*	*	6*
Maymon et al. (29) 1998	*	*		**	*	*	6*

Three parameters related to risk of bias were assessed in each included study: the selection of the study and the measured outcome. Each parameter consists of subcategorized questions: selection (n = 4), and outcome (n = 2). Stars awarded for each item serve as a quick visual assessment for the methodological quality of the studies. A study can be awarded a maximum of 9 stars, indicating the highest quality. Studies were classified as 'low risk' of bias when scoring ≥ 6 stars, while 'high risk' of bias received <6 stars.

Table-4: Begg and Egger table for variable

Variables	Egger's test	Begg's test
Macrosomia	0.815	0.764
Cesarean	0.528	0.533
Preterm delivery	0.796	0.548
Fetal distress	0.909	0.902
Large-for-Gestational-Age	0.549	1
Apgar score <7 min 5	0.452	0.548
Neonatal Intensive Care Unit	0.106	0.548

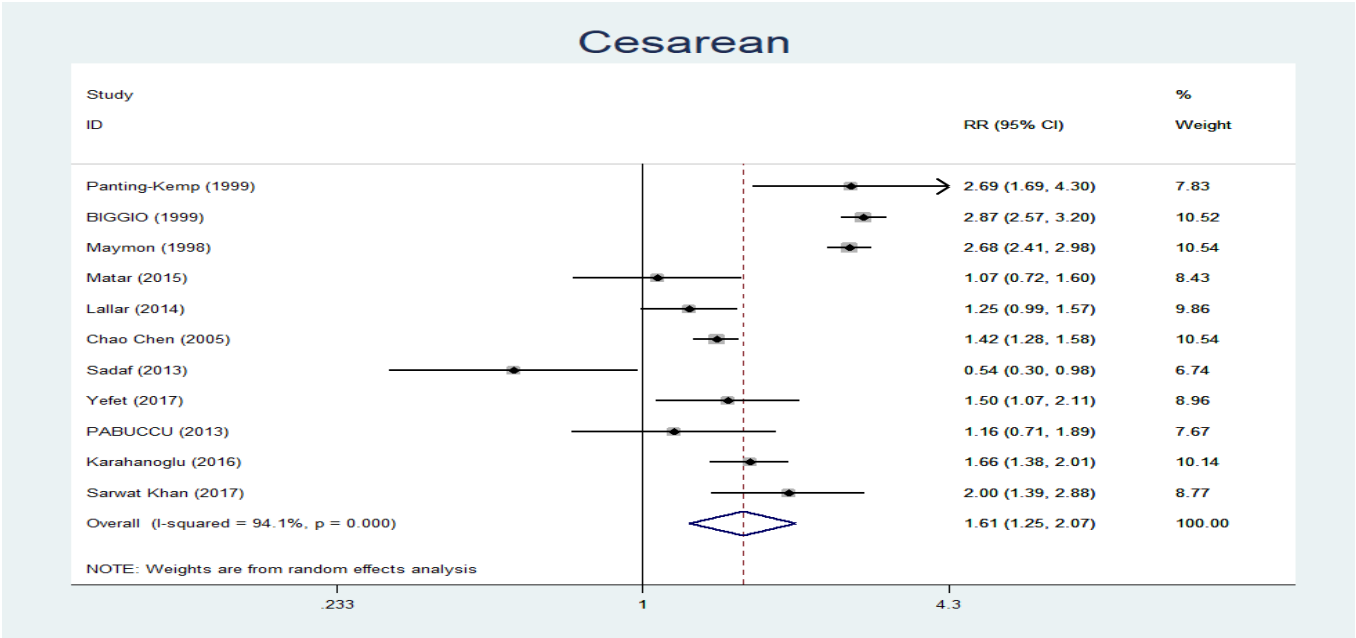

Fig. 2: The RR of cesarean based on random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and diamond mark illustrates the pooled estimate of RR in all of the studies.

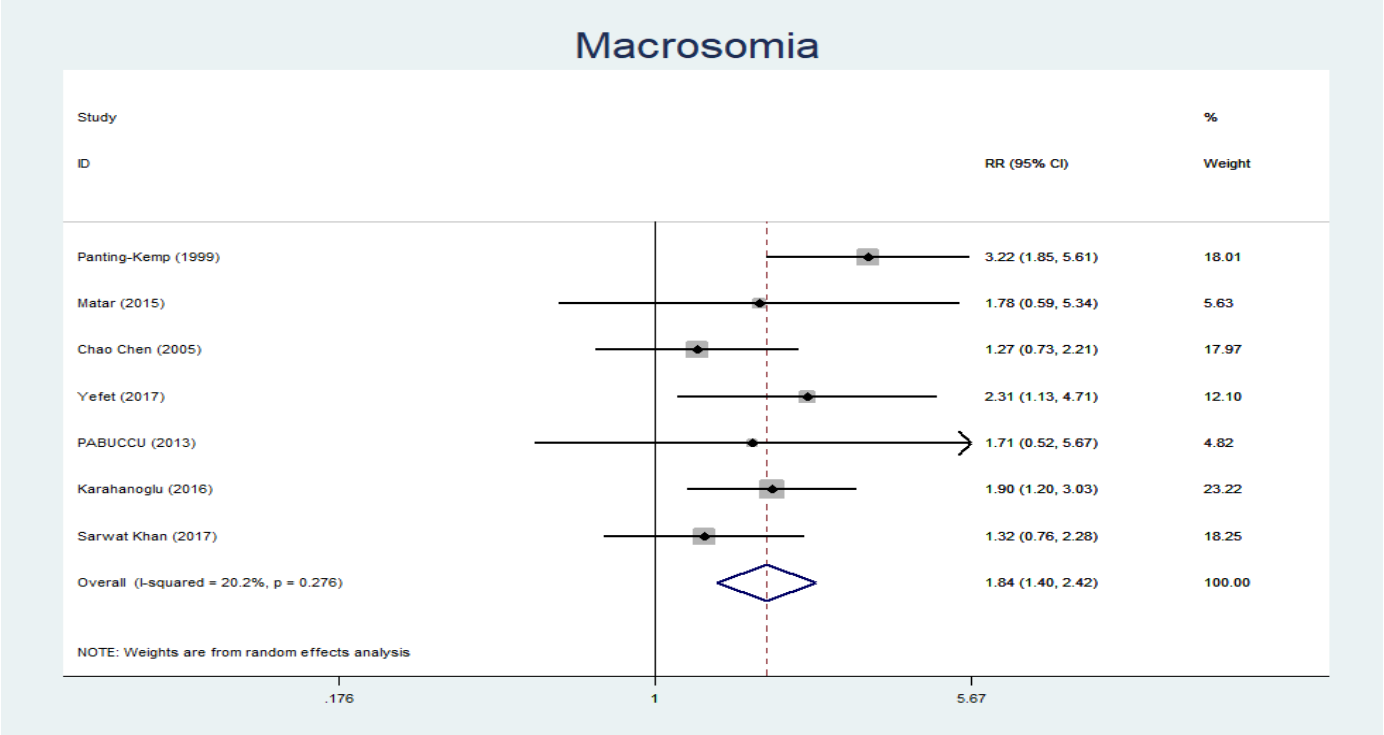

Fig. 3: The RR of macrosomia based on random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and diamond mark illustrates the pooled estimate of RR in all of the studies.

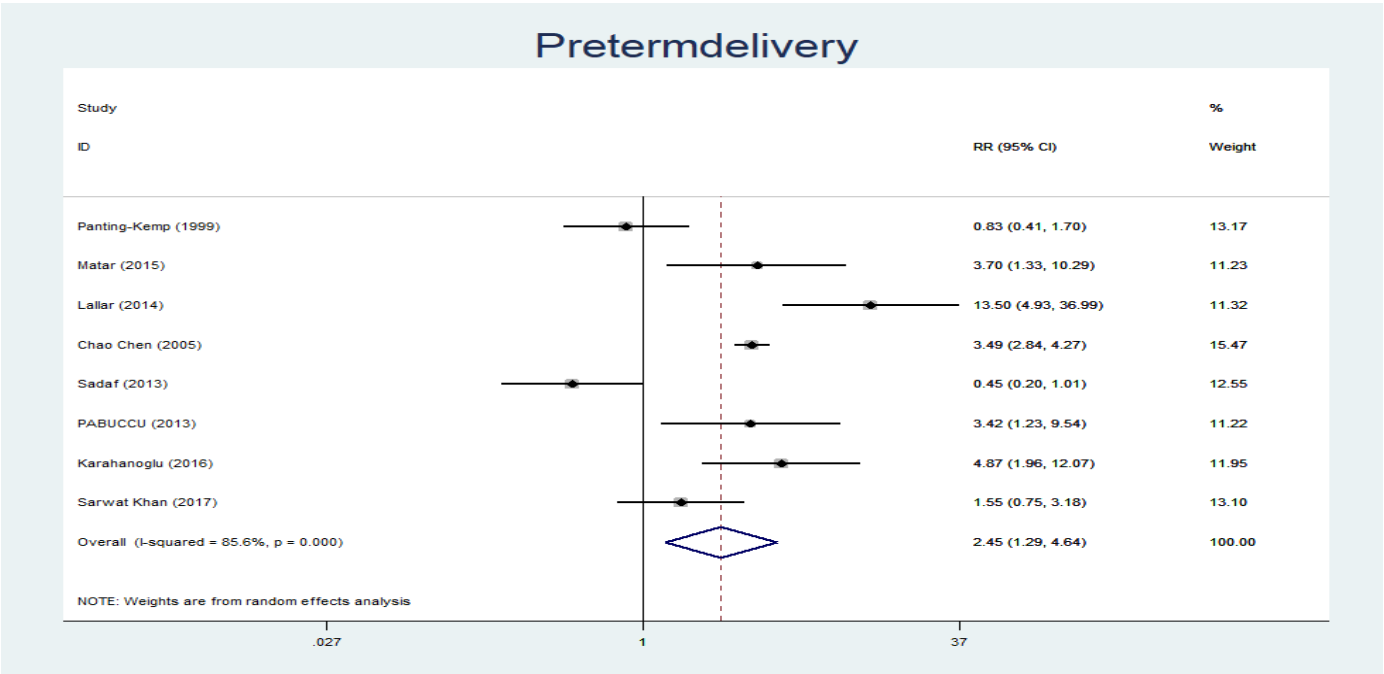

Fig. 4: The RR of preterm delivery based on random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and diamond mark illustrates the pooled estimate of RR in all of the studies.

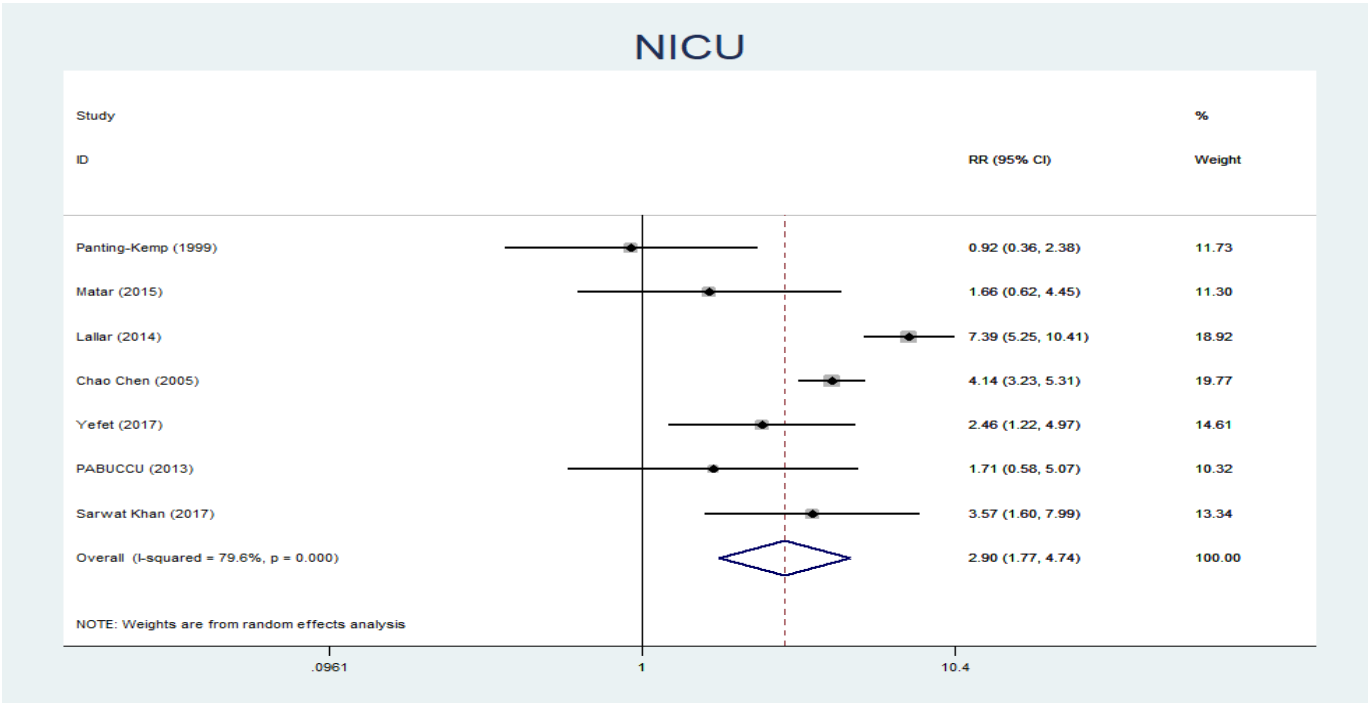

Fig. 5: The RR of NICU based on random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and diamond mark illustrates the pooled estimate of RR in all of the studies.

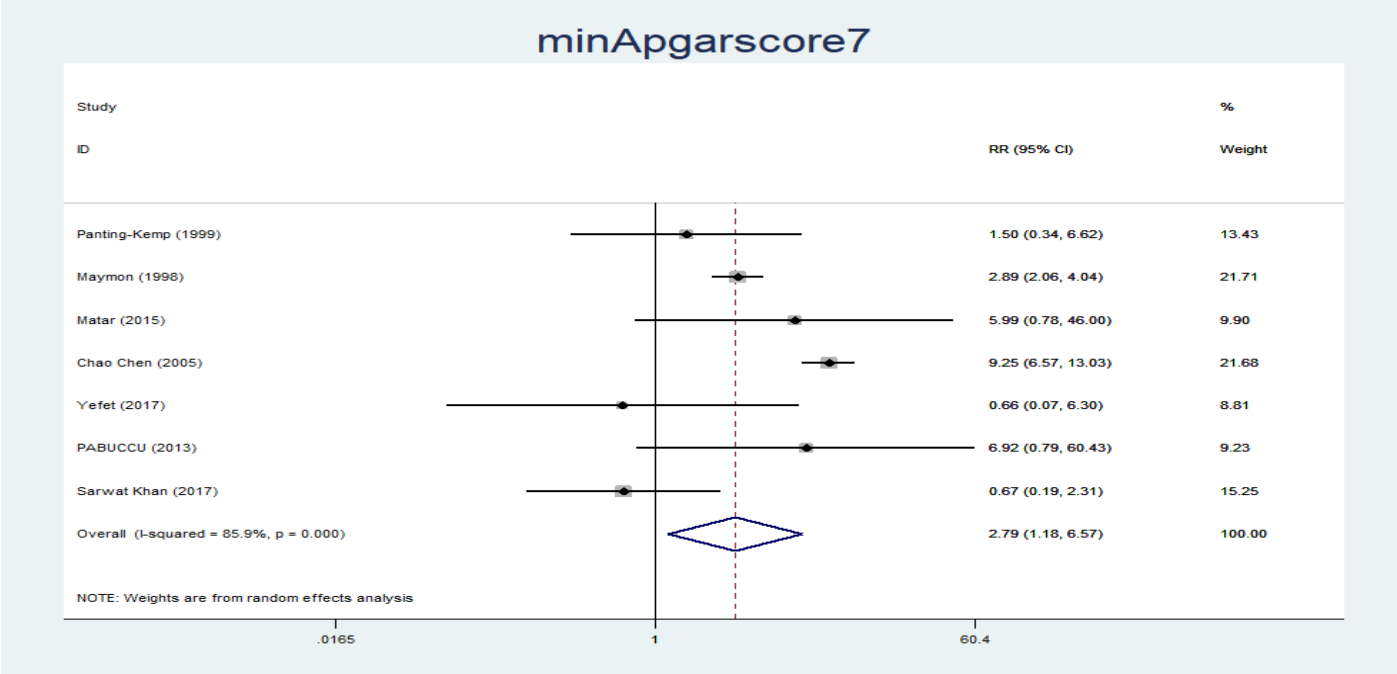

Fig. 6: The RR of APGAR score 5 Min <7 based on the random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and the diamond mark illustrates the pooled estimate of RR in all of the studies.

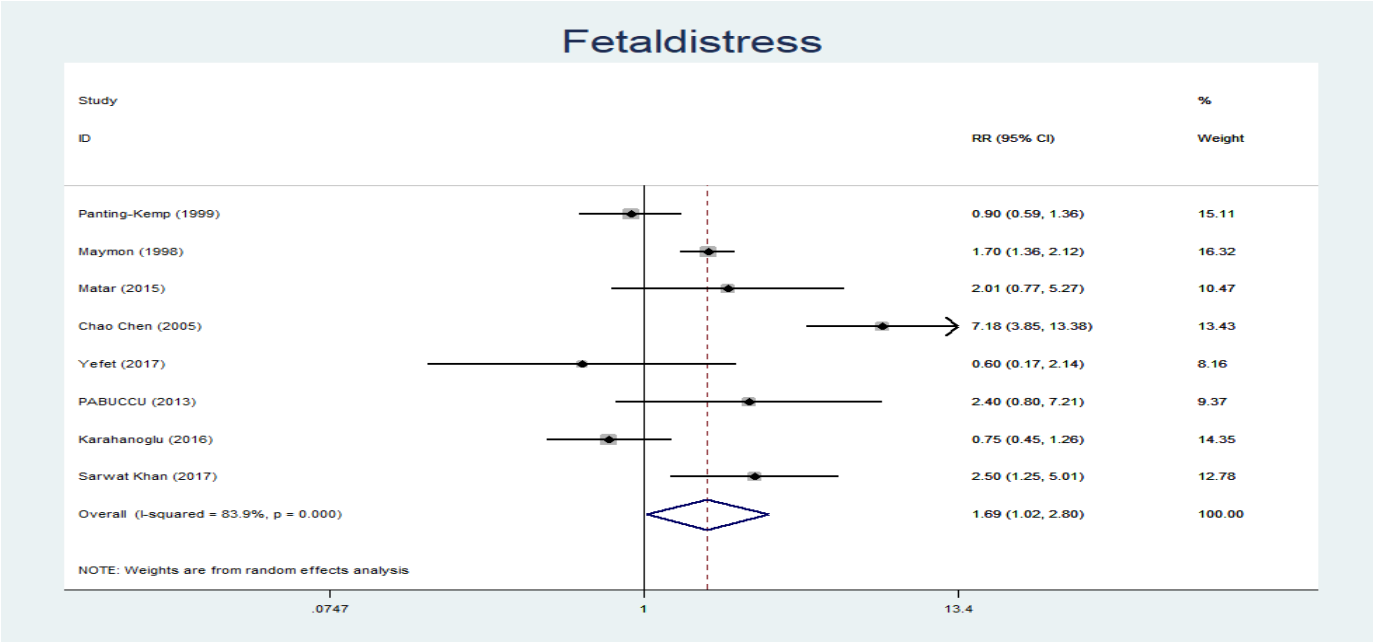

Fig. 7: The RR of fetal distress based on a random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and the diamond mark illustrates the pooled estimate of RR in all of the studies.

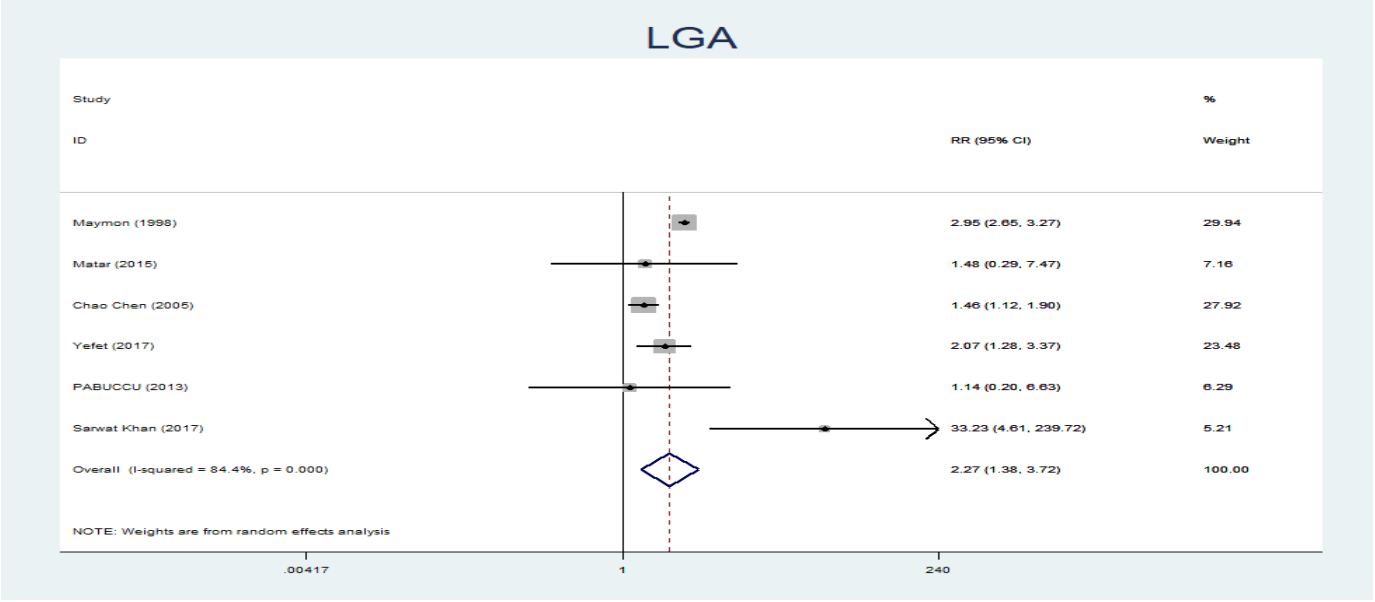

Fig. 8: RR of LGA based on random effects model; the midpoint of each line segment shows estimating the RR, the length of line segment indicates a confidence interval of 95% in each study, and the diamond mark illustrates the pooled estimate of RR in all of the studies.

4- DISCUSSION

Polyhydramnios is one of the common disorders among pregnancies and most often is observed as a result of several maternal and fetal disorders. On the other hand, it is really hard to clear out the cause in the majority of the cases. Since exact etiology of idiopathic polyhydramnios is still unclear, many studies have been conducted to clarify the actual mechanisms of the regulation of amniotic fluid and even molecular interactions that are

involved within regulation. In this perspective, an increasing number of clinical and molecular studies is designed to define the molecular architecture of biologic membranes, which are involved with amniotic fluid regulation. Most recently, increased aquaporin expression has been reported in the fetal membranes of cases complicated with idiopathic polyhydramnios (16,17). Besides the mechanism, reports investigating perinatal outcomes which are novel for clinicians are also limited and have not been extensively addressed in scientific literature so far (18, 19). Moreover, there is still lack of universal guidelines for such cases in obstetric practice. The present study was conducted to investigate the perinatal outcomes of idiopathic polyhydramnios with a normal ultrasound (8, 20, 21). The results of this meta-analysis showed that there is a higher RR for the outcomes including NICU admission (RR: 2.9), Apgar scores min 5 < 7 (RR: 2.7), preterm birth (RR: 2.4), and LGA (RR: 2.2).

The RR of other consequences such as macrosomia (RR: 1.8), fetal distress (RR: 1.6), and C.S. (RR: 1.6) was lower. The previous narrative review performed by Magann et al. (2007) showed that Idiopathic polyhydramnios was linked to fetal macrosomia the larger studies. There was an increase in the risk of adverse pregnancy outcomes such as preterm birth, Apgar score < 7 at 5 min, LGA, meconium, C.S., NICU admission, and a 2-5-fold increase in the risk of perinatal mortality. This study recommended performing further prospective studies in this area. This topic was studied where the risk of an adverse pregnancy outcome and perinatal mortality are increased (1). Our meta-analysis study confirmed adverse perinatal outcomes. We found an association of idiopathic polyhydramnios with preterm birth. Similar results were found in some other studies (4, 8, 9, 19, 21-23); while others did not agree with this finding (2, 3, 12, 25, 26). The reason for the difference probably relates to different selection criteria including high-risk pregnancies and sample size. Additionally, some studies reported low Apgar scores at 1 min (27), and 5 min (4, 19, 21, 23, 26-28). In our study, idiopathic polyhydramnios was associated with low Apgar scores in 5 min; while other studies did not agree with this finding (2, 3). This disagreement is probably related to the type of study (cross-sectional) (2), and a higher sample size (3). There was an increase in cesarean section risk, similar to other studies (2-4, 8, 12, 20, 23, 24, 27, 30). Our study showed a significant correlation between polyhydramnios and LGA (4, 22, 27, 30). An association for fetal distress was found in our study, which is in agreement with results of other studies (3, 4, 20, 30). We also noticed an increase in the number of NICU admissions in the idiopathic polyhydramnios group. Most of the studies done previously had similar observations (3, 4, 8, 20, 22-24, 27); while only one study did not agree with this finding (2).

The reason for the difference in the results is probably due to the type of study. Also, this study showed that the risk of macrosomia also increased such as other studies (2, 4, 22). According to our knowledge, this is the first systematic review and meta-analysis study that reports the perinatal outcome of idiopathic-polyhydramnios with a normal ultrasound. This meta-analysis showed a clear association between perinatal outcomes with idiopathic polyhydramnios. A precise intrapartum monitoring and further attention in the postpartum period are recommended in pregnant women with idiopathic-polyhydramnios with a normal ultrasound. Tests that may be helpful for antenatal evaluation of these high-risk pregnancies are Doppler flow velocimetry of the middle cerebral artery, non–stress

test, biophysical profile, and contraction stress test. Therefore, surveillance of these pregnancies is required, especially near term and after birth. The strengths of this study are that the healthy low-risk pregnant women without illnesses affecting idiopathic polyhydramnios were included in this study. As a guideline for future research, conducting cohort studies from perinatal to the postnatal period that may perfectly show outcomes of Idiopathic hydramnios with normal ultrasound is recommended.

5- CONCLUSION

The results of this study showed that there exists a clear association between perinatal adverse outcomes with idiopathic polyhydramnios. Although perinatal outcomes are conflicting in literature, idiopathic polyhydramnios warrants close surveillance especially near term. The intensive intrapartum monitoring and further attention in the postpartum period are recommended in this regard. Even though it has not been extensively addressed in scientific literature, idiopathic polyhydramnios should be managed with reasonable diligence in light of available reports. Further larger studies are needed to resolve complex mechanisms and to establish universal guidelines.

6- CONFLICT OF INTEREST: None.

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