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RESEARCH ARTICLE

ASSOCIATION OF SONOGRAPHIC POLYHYDRAMNIOS WITH PRETERM BIRTH.

Ayesha Tariq, Mishal Javaid, Muhammad Zubair, Sarah Maryam, Yousef Gilani and Syed Amir Gilani.
University Institute of Radiological Sciences and Medical Imaging Technologies, Faculty of Allied Health Sciences, University of Lahore, Lahore, Pakistan.

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Amniotic fluid index, Preterm birth, Polyhydramnios, Adverse perinatal outcomes.

Abstract

Polyhydramnios carries a high rate of complications during pregnancies and adverse perinatal outcomes. The aim of this study was to evaluate the risk of preterm birth in patients with polyhydramnios.

Objective: To determine the association of sonographic polyhydramnios with preterm birth.

Methods: A cross-sectional Analytical study was carried out at the Department of Radiology in Sir Ganga Ram Hospital Lahore, Pakistan. Duration of study was from March 2018 to November 2018. Patients in 2nd and 3rd trimester of pregnancy with Polyhydramnios were chosen subsequent to fulfil consideration (inclusion) and rejection (exclusion) criteria. A complete history and investigation were finished. All necessary examination is done. Polyhydramnios confirmed by estimating AFI. Statistical Software for Social Sciences (SPSS version 22.0) is used for the analysis of all data. Standard and Mean Deviation (SD) remained calculated for continuous variables.

Results: Total of 64 patients were diagnosed in this study. The Mean ±S.D age was 26.92 ± 3.55 years. Out of 51 patients of 21-29 age group 42 were diagnosed with polyhydramnios and 9 were without polyhydramnios and 23 patients had full-term deliveries and 28 patients had preterm deliveries. In 30—38 age group total 13 patients out of which 10 patients with polyhydramnios and 3 patients without polyhydramnios and 4 patients had full-term deliveries and 9 patients had preterm deliveries. Minimum AFI is 8.0 and Maximum AFI 55.0 with Mean ±S.D of 26.70 ± 9.40. Minimum GA was 141 and Maximum GA 244 days with Mean±S.D of 244.95 ± 27.07. 27. Patients were full-term delivery out of 18 patients have polyhydramnios and 9 patients have no polyhydramnios. 37 patients were preterm delivery out of which 34 Patients have polyhydramnios and 3 patients have no polyhydramnios.

Conclusion: This study concluded that excess of amniotic fluid lead towards preterm birth. This is also found patients of 21-29 ages were more prone to polyhydramnios.

Corresponding Author:-Ayesha Tariq.
Address:-University Institute of Radiological Sciences and Medical Imaging Technologies, Faculty of Allied Health Sciences, University of Lahore, Lahore, Pakistan.

Introduction:-

Polyhydramnios is a medical condition describing an excess of amniotic fluid in the amniotic sac[1]. Polyhydramnios is generally detected either by physical examination if the uterus appears larger or measures larger than expected by the pregnancy dating, by sonography at the time of the fetal anatomic survey, or when the development of other conditions warrants assessment of the amniotic fluid or fetal growth during a pregnancy[2]. Amniotic fluid provides an optimal environment for normal fetal growth and development. The AFV is the result of a series of complex and dynamic pathways influencing the movement of fluid into and out of the amniotic space. This balance is regulated by mechanisms that are not yet completely understood[3]. The main sources determining the AFV include fetal urine production, fetal swallowing, secretion of fetal lung fluid, movement of water and solutes between fetal blood and the placenta (intramembranous pathway), movement of water and solutes across the surface of the amnion and chorion (trans membranous pathway), secretions by the fetal oral and nasal cavities, and movement of fluid across fetal skin during early gestation[4]. A disturbance in any of these processes can result in an abnormally low or high AFV, referred to as oligohydramnios or polyhydramnios, respectively. The main routes of amniotic fluid removal are fetal swallowing and absorption via the intramembranous pathway [3]. Polyhydramnios can result from an imbalance in any of these pathways. Decreased elimination of amniotic fluid, either from anomalies (e.g., choanal atresia, esophageal atresia, tracheoesophageal fistula, and duodenal or intestinal atresia) or as a result of reduced swallowing ability or function, which can be due to neurologic impairment (e.g., anencephaly) or neuromuscular disorders (eg, myotonic dystrophy), drug-induced, or potentially a result of fetal hypoxia as evidenced in the ovine model, can all result in hydramnios[5]. Polyhydramnios has three terms the terms mild, moderate, and severe have been used to describe degrees of polyhydramnios. Mild hydramnios has been defined as an AFI of 25 to 30 cm or an SDP of 8 cm or greater, moderate hydramnios as an AFI of 30.1 to 35 cm or an SDP of 12 cm or greater, and severe hydramnios as an AFI of 35.1 cm or greater or SDP of 16 cm or greater[6]. Increasing severity of polyhydramnios appears to correlate with an increased risk of perinatal mortality and congenital abnormalities[7]. Polyhydramnios is associated with fetal and maternal complications such as respiratory distress, thromboembolism, preterm labour, atonic uterus, anaemia, caesarean section, premature fetus, umbilical cord prolapse caused by the rupture of the membranes and fetal distress[8]. A fetus close to term will produce between 500–1200 ml urine and swallow between 210–760 ml of amniotic fluid per day. Even small changes in this equilibrium can result in significant changes in amniotic fluid volumes[9]. A disturbed equilibrium can be the result of compromised swallowing function or increased urination and can lead to polyhydramnios [9]. Increased urine production, as occurs with increased cardiac output associated with fetal anaemia, can also result in increased production of amniotic fluid[10].

The risk of the preterm birth, umbilical cord prolapse is increased when polyhydramnios is present due to over-expansion of the uterus[11]. The rate of preterm delivery at < 34 weeks increases as the maximal AFI increases, and reaches 19.4% with an AFI ≥ 35 cm[12]. Preterm labour and subsequent preterm delivery are often thought to be directly related to polyhydramnios, as a result of the increasing volume of amniotic fluid. This correlation is reasonable to make considering that the increasing distention of the uterus can result in uterine contractions. Thus, one would expect there to be a higher rate of preterm labour and preterm delivery in those women with increasingly higher AFVs correlating with increasing severity of polyhydramnios[2]. Preterm birth, defined as delivery prior to 37 completed weeks, is a public health priority Because preterm birth can result in significant morbidities and mortalities[13,14]. Premature birth is a birth that takes place more than three weeks before the baby's estimated due date. In other words, premature birth is one that occurs before the start of the 37th week of pregnancy. Very pre-term, born at less than 32 weeks of pregnancy. Extremely preterm, born at or before 25 weeks of pregnancy[15].
Ultrasound is still a useful diagnostic and follow-up modality in polyhydramnios patients[16]. Clinically, polyhydramnios is identified using either the clinician's subjective impression of an increased amount of amniotic fluid during a sonographic assessment or using a sonographic measurement to estimate the amniotic fluid volume (AFV). Two commonly used sonographic measurements that suggest a high volume of amniotic fluid include an amniotic fluid index (AFI) of 25 cm or greater or a single deepest pocket (SDP) of 8 cm or greater[17]. In mild cases, simple control and follow-ups, continuous ultrasound and conservative treatment methods are recommended[18]. It is also the method of choice in multiple gestations. In cases with multiple gestations, a range of 3–8 cm is defined as normal. With this method, polyhydramnios is classified as mild, moderate or severe[19] For the 4-quadrant method (AFI – Amniotic Fluid Index) the deepest amniotic pocket in each of the four quadrants is measured vertically and the values added together[20]. Inclusion Criteria: Singleton pregnancies in between 16 – 42 weeks of gestation. Polyhydramnios with an amniotic fluid index of at least 25 cm. Exclusion Criteria: Patient with uterine anomalies, multiple pregnancies and fetal chromosomal anomalies.

Methods:-

A cross-sectional Analytical study was carried out at the Department of Radiology in Sir Ganga Ram Hospital Lahore, Pakistan. Duration of study was from March 2018 to November 2018. Patients in 2nd and 3rd trimester of pregnancy with Polyhydramnios were chosen subsequent to fulfil consideration (inclusion) and rejection (exclusion) criteria. A complete history and investigation were finished. All necessary examination is done. Polyhydramnios confirmed by estimating AFI. Statistical Software for Social Sciences (SPSS version 22.0) is used for the analysis of all data. Standard and Mean Deviation (SD) remained calculated for continuous variables.

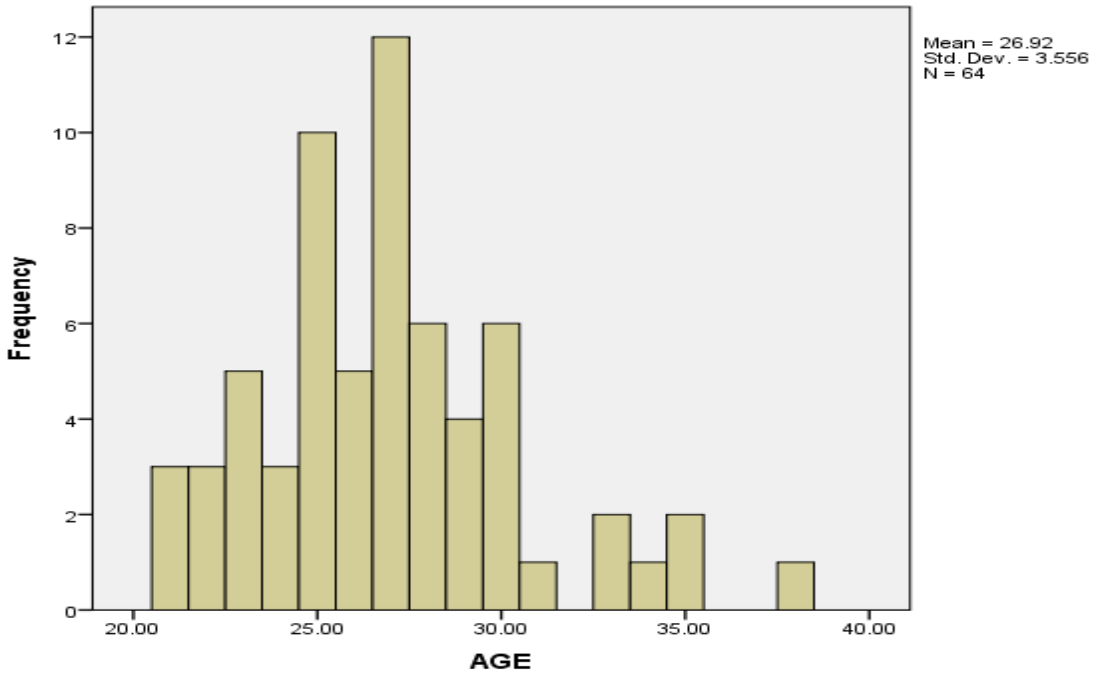
Results:-

Out of 64 patients, the Mean ±S.D age was 26.92 ± 3.55. The Minimum age of patient were 21 and Maximum age 38 in table 1, figure 1.

Table 1:-Descriptive statistics of Age

	N	Minimum	Maximum	Mean	Std. Deviation
Age	64	21	38	26.9219	3.55592
N	64				

Figure 1:-Descriptive statistics of age



According to table 1.1, Group A age 21—29 and total patients 51 out of which 42 patients with polyhydramnios and 9 patients without polyhydramnios. Group B age 30—38 and a total 13 patients out of which 10 patients with polyhydramnios and 3 patients without polyhydramnios

Count				
		Other reason		Total
		with polyhydramnios	without polyhydramnios	
Age groups	21----29	42	9	51
	30----38	10	3	13
Total		52	12	64

Table 1.1:-Group wise age distribution with and without polyhydramnios

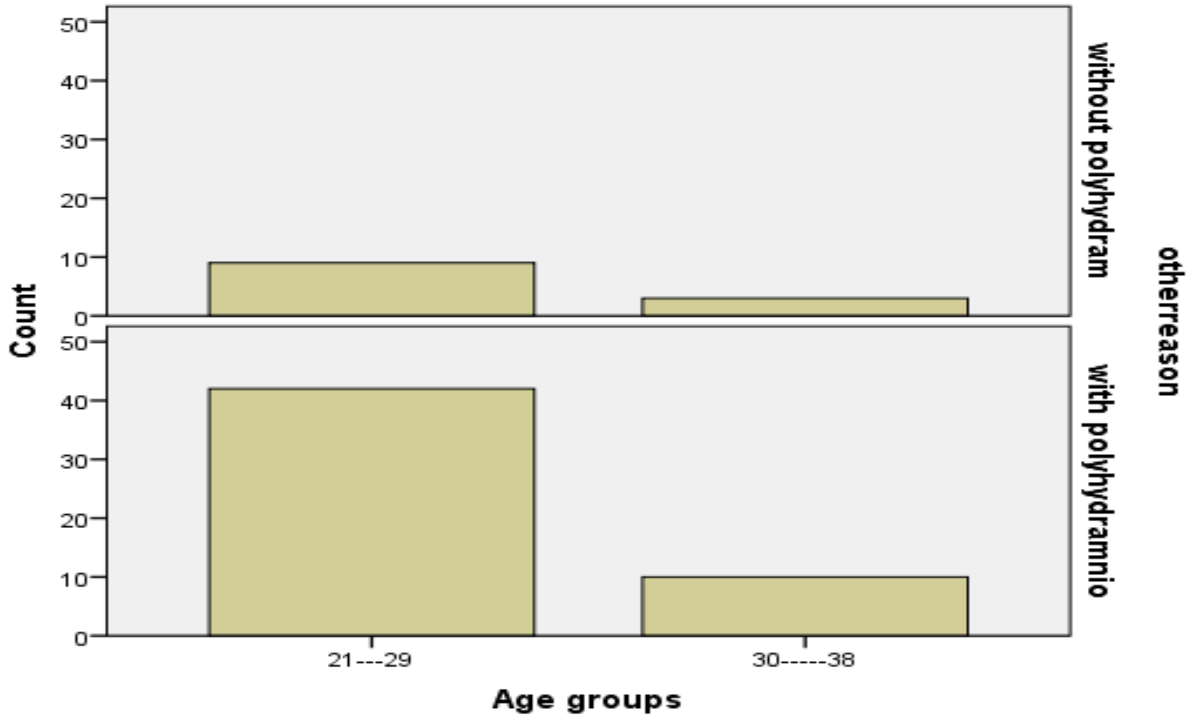


Table 1.1:-Group wise age distribution with and without polyhydramnios

Table number 1.2 show that Group A, age 21—29, 23 patients had full-term deliveries and 28 patients had preterm deliveries out of 51. Group B age 30—38, 4 patients had full-term delivery and 9 patients had preterm delivery out of 13.

		Delivery		Total
		Full term	preterm	
Age groups	21---29	23	28	51
	30----38	4	9	13
Total		27	37	64

Table 1.2:-Age wise distribution according to full term and preterm deliveries

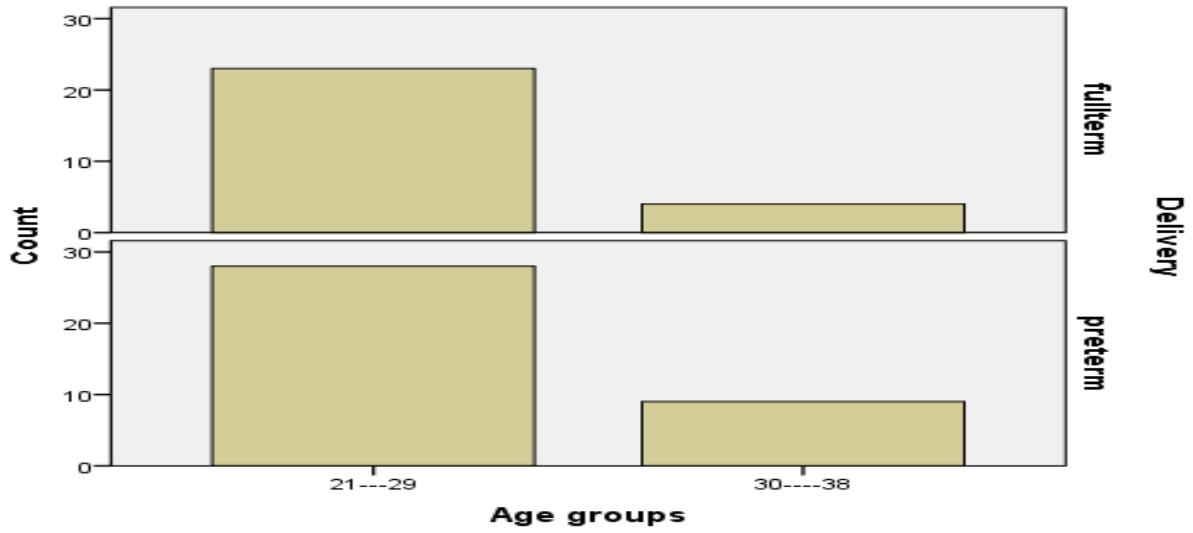


Fig 1.2:-Age wise distribution according to full term and preterm deliveries.

According to table 1.3, in the age group 21-29, out of 42 of polyhydramnios patients, 16 had full term and 26 had preterm labour. And without polyhydramnios, 7 had full term and 2 had preterm out of 9. In age group 30-38, out of 10 of polyhydramnios patients, 2 had full term and 8 had preterm. And without polyhydramnios, 2 had full term and 1 had preterm out of 3.

Age groups			Delivery		Total
			Full term	preterm	
21---29	Other reason	with polyhydramnios	16	26	42
		without polyhydramnios	7	2	9
	Total		23	28	51
30----38	Other reason	with polyhydramnios	2	8	10
		without polyhydramnios	2	1	3
	Total		4	9	13
Total	Other reason	with polyhydramnios	18	34	52
		without polyhydramnios	9	3	12
	Total		27	37	64

Table 1.3: the -Other reason for delivery according to age groups

According to table 2 and figure 2, The Minimum AFI is 8.0 and Maximum AFI 55.0 with Mean ±S.D of 26.70 ± 9.40.

	N	Minimum	Maximum	Mean	Std. Deviation
Amniotic Fluid Index (AFI)	64	8.00	55.00	26.7031	9.40564
N	64				

Table 2:-Descriptive statistics of AFI

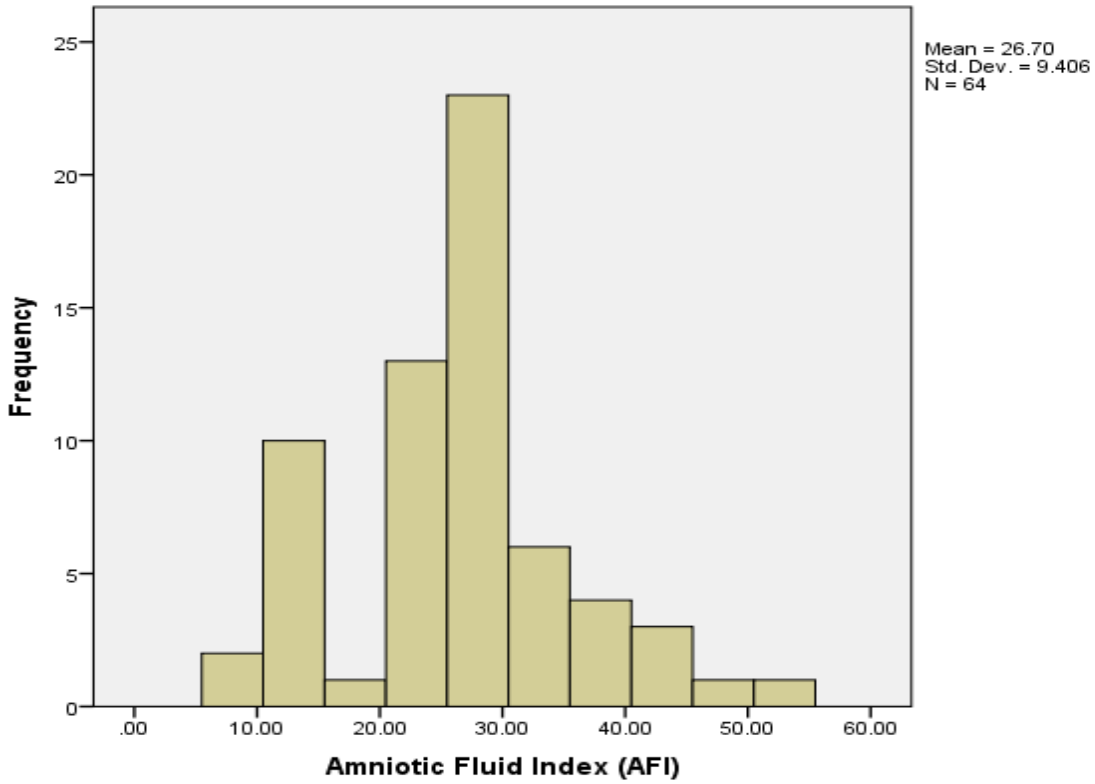


Figure 2:-Descriptive statistics AFI

According to table number 3 and figure 3, Minimum GA was 141 and Maximum GA 244 days with Mean ±S.D of gestational age was 244.95 ± 27.07 of 64 females.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Gestational age (GA) in days	64	141.00	280.00	244.9531	27.07804

Table 3:-Descriptive statistics gestational age

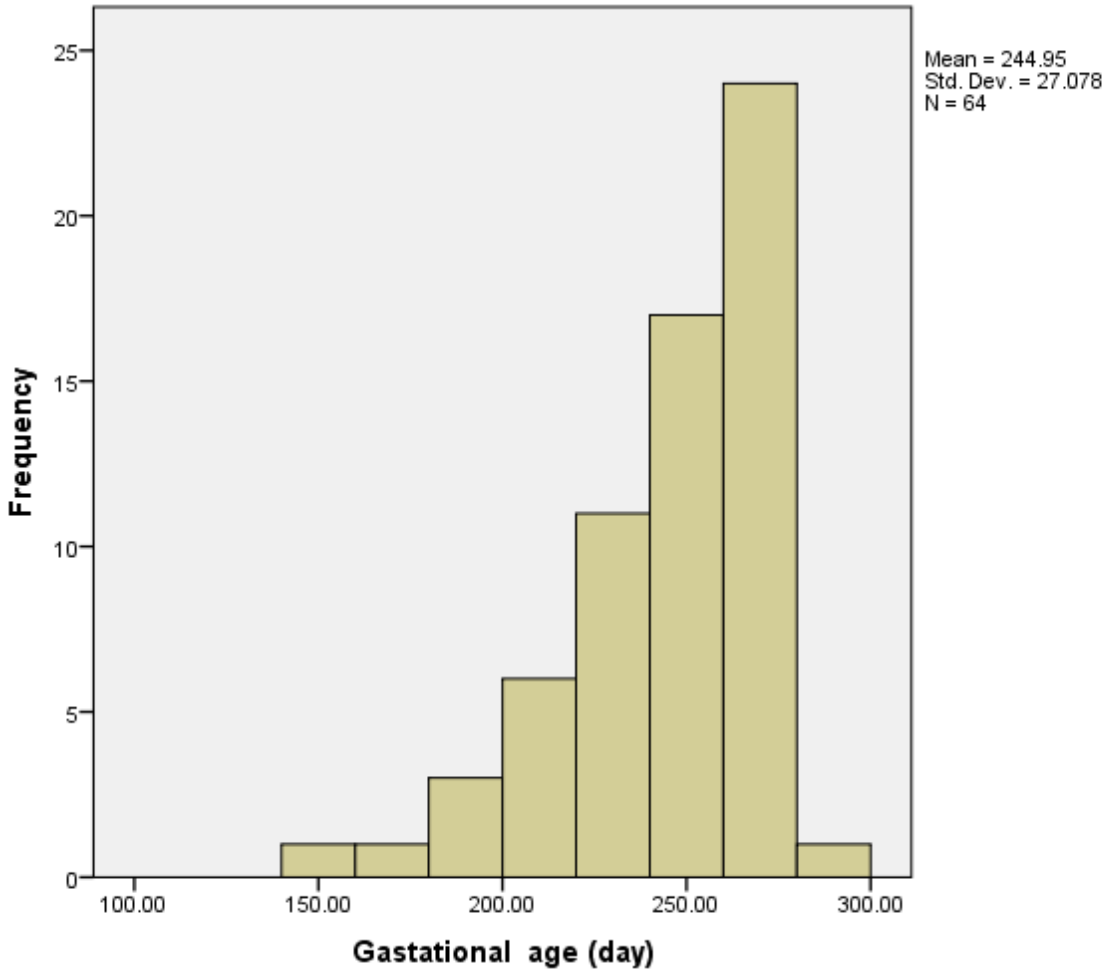


Figure 3:-Descriptive statistics gestational age

Total 64 patients, 27 patients were full-term delivery out of 18 patients have polyhydramnios and 9 patients have no polyhydramnios. 37 patients were preterm delivery out of which 34Patients have polyhydramnios and 3 patients have no polyhydramnios in table number 4 and figure 4.

Delivery * other reason Cross tabulation

		Other reason		Total
		with polyhydramnios	without polyhydramnios	
Delivery	Full term	18	9	27
	preterm	34	3	37

Total	52	12	64

Table 4:-Delivery * other reason Cross tabulation

Figure 4.1:-Delivery with polyhydramnios and without polyhydramnios

Fig 4.2:-Delivery with the full term and preterm

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.520[a]	1	.011		
Continuity Correction	4.969	1	.026		
Likelihood Ratio	6.574	1	.010		
Fisher's Exact Test				.021	.013
N of Valid Cases	64				

Discussion:-

The current research was designed to determine the association of sonographic polyhydramnios with preterm birth. The results of my study were comparable with the result of the research conducted by Ahkam Goksel *et al*, (2013) studied on Perinatal outcomes of idiopathic Polyhydramnios. This study was conducted at the department of obstetrics from 2008 to 2010. Retrospective analysis of 160 singleton pregnancies that were under routine surveillance at the department of obstetrics from 2008 to 2010 was performed to assess perinatal outcomes. 59 cases were included as idiopathic Polyhydramnios and 101 cases were included as controls. Preterm delivery (<37 weeks) was selected. A result shows that significantly higher preterm labours were noted in the polyhydramnios group compared with the control group. In the end, he concluded that although perinatal outcomes are conflicting in literature, idiopathic polyhydramnios warrants close surveillance, especially near term. The result of my study shows that there was an association of polyhydramnios with preterm birth but preterm birth also occurs due to many other reasons. Ultrasonography is almost always a decent beginning decision and is uncomplicated circumstances, might be all that is required. So my study agrees with the others study that apart from the affectability and specificity of ultrasound, it is non-invasive, readily available, portable and inexpensive.

Conclusion:-

The significant value of the current study is .021, so it's justified to state that there is an association of polyhy dramnios with preterm birth.

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