



## Routine ultrasound screening in diabetic pregnancies in Saudi Arabia

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Routine ultrasound screening was performed on 86, diabetic Saudi pregnant women, ranging from 16-43 years old. Descriptive statistics of patient data are presented as mean, standard deviation, minimum and maximum for patients age, FL per week, BPD per week, and weight per gram. For patients age, the mean  $\pm$  SD was  $29.88 \pm 6.45$  years, for FL/W and BPD/W was  $30.56 \pm 6.29$  and  $29.57 \pm 7.62$  respectively and for weight was  $2.193 \pm 1.053$  kg. Frequency distribution for age group and placenta position, for the age group 31-35 was dominant with 26 patients than age group 21-25 and 26-30 years with 18 patients for each while the group 41-45 years was lower frequent with 3 patients. The most common placenta position was fundal anterior and posterior, with 23 patients. Each fundal was less frequent with 10 patients. The amount of amniotic fluid was normal in 78 patients, while 3 patients had oligohydramnios and 6 had polyhydramnios. A correlation was detected between the patient's age group with placenta position. Of twenty-six patients aged 31-35 years, the position of the placenta was fundal in 6 patients, fundal posterior in 6, anterior position in 8, posterior in two, and 4 patients were fundal position. Analysis of variance for weight/gm with FL/W and BPD/W showed there is no significant difference between the baby's weight with measurement for FL/W ( $p = 0.387$ ) and BPD/W ( $p = 0.429$ ).

**Keywords:** diabetic pregnancies, FL, BPD, baby weight

### INTRODUCTION

In pregnancy, diabetes can have debilitating complications if it is not managed promptly (Wier LM, et al 2010). Gestational diabetes mellitus is one of the most common causes of antenatal complications. GDM is a condition of carbohydrate intolerance that first manifests itself during pregnancy (ACOG Practice Bulletin 2013; Metzger B. et al 1998). Between 1% and 14% of pregnancies are affected by GDM (Gestational Diabetes Mellitus 2002). Diabetes during pregnancy is most common in women who have gestational diabetes mellitus (GDM). GDM has maternal as well as neonatal complications. Uncontrolled GDM has profound effects on foetal growth and neonatal health; adverse maternal and neonatal outcomes in births with controlled GDM are higher than in high-risk pregnancies without GDM (Abdallah Almarzouki A. et al 2013).

While improvements in diabetes control have reduced the incidence of preterm delivery and stillbirth,

the incidence of major congenital malformations has remained unchanged. As a result, congenital anomalies represent 40%–50% of perinatal deaths among diabetic infants (Reece EA, et al 1986; Traub AI, Harley JM, et al 1987; Roberts AB, et al 1990; Hawthorne G, et al 1990).

If performed by experienced sonographers during the second trimester, routine ultrasound screening can detect between 40% and 70% of major congenital anomalies (Saari-Kemppainen A, et al 1990; Grandjean H, et al 1990). It can also facilitate preparations for optimal management during and after delivery. When major congenital anomalies are detected antenatally, the options for treating them in utero, or, in some cases, performing foetal surgery, can be discussed. As a result, routine morphological ultrasound scans are widely available. Even with this routine practice, the rates of congenital anomalies-related perinatal death in diabetic pregnancies have not changed over the last decade (McElvy SS, et al 2000). The efficacy of routine ultrasound screening in this

special group of women has not been reported (Albert et al. 1996) reported favorable results from a comprehensive screening programme, which detected 70% of congenital foetal anomalies.

The patients may also experience operative delivery, shoulder dystocia, macrosomia, birth injury and respiratory distress syndrome (RDS) in addition to hypoglycemia, hypocalcemia, hyperbilirubinemia, polycythemia, and asphyxia. Diabetes diagnosis, monitoring, and control, as well as fetal well-being assessment may decrease neonatal complications and minimise the impact of diabetes on the fetus. This non-stress test has been used to assess fetal well-being during high-risk pregnancies (Landon MB, et al 1985).

Using ultrasound (US) to estimate fetal weight has become part of everyday obstetric practice over the last 40 years. Making decisions regarding obstetric care is based on the results of this study (Boulet SL, et al 2003). There are different combinations of biometric parameters used in many formulas used to estimate fetal weight (Dudley NJ. Et al 2005; Hadlock FP, et al 1985; Shepard MJ, et al 1982; Faschingbauer F, et al 2015). In cases of suspected macrosomia, it is crucial to have accurate US estimations of fetal weight. Among the illnesses associated with this state are prolonged labour, shoulder dystocia, asphyxia, brachial plexus palsy, neonatal hypoglycemia, and postpartum hemorrhage (Oral E, et al 2001; Srichumchit S, et al 2015; HAPO Study 2008; McFarland LV, et al 1986; Landon MB, et al 2009; Rolo LC, et al 2010; Patterson RM. 1985; Dietz HP. 2010; Jangö H, et al 2014). One cause of the M (American College of Obstetricians and Gynecologists Committee on Practice 2016).

## MATERIALS AND METHODS

A sample of pregnant Saudi females, ranging from 16-43 years of age, was recruited from Almadina Almonwara city. Participants were enrolled into the study when they attended the radiology department for routine obstetric evaluation. The grey-scale US was performed.

**Patient Preparation** .When undergoing trans-abdominal US examination, a full bladder is imperative since it pushes the uterus out of the pelvis and provides an acoustic window. When performing trans-vaginal US, the bladder must be empty because even small amounts of urine can cause the uterus to move. The patient is asked to lie on her back and asked to raise her arms above her head. A warm water-based gel is applied to the area of the body being examined by a radiologist (a physician trained specifically to supervise and interpret radiology examinations) or sonographer after being placed on the examination table. The gel will help the transducer make

secure contact with the body and eliminate air pockets between the transducer and the skin that can block the sound waves from passing into the body.

### Imaging protocol:

Intermittent high-frequency sound waves are generated by applying an alternating current to a transducer, which is "connected" to the abdominal or vaginal wall by through the gel-coupling agent. Real-time ultrasonography involves resonating the sound waves through soft tissues and reflecting some of their energy back to the transducer, which is then amplified and displayed on a screen. An ultrasound can be used for measurement of foetal activity, including breathing, heartbeat, and vessel

pulsations. An ultrasound can also accurately determine the size of the amniotic sac and embryo, as well as calculate the rate of fetal growth..

### US imaging technique:

The ultrasound transducer or probe is moved slowly across the abdomen along transverse, oblique and long axes to show and identify the foetus, amniotic fluid and placenta on the ultrasound screen.

## RESULTS AND DISCUSSION

Table 1. Show descriptive statistic for patients were the data presented as mean, standard deviation, minimum and maximum for patents age, FL per week, BPD per week and weight per gram. For the patients' ages, the mean  $\pm$  SD was  $29.88 \pm 6.45$ , for FL/ W and BPD/W was  $30.56 \pm 6.29$  and  $29.57 \pm 7.62$  respectively and for weight was  $2.193 \pm 1.053$  kg. The most frequent age group was 31–35 years 26 patients. The next most common age groups were 21–25-years and 26–30 years, both of which had 18 patients. The lowest population group was 41–45 years with 3 patients. As shown in Table 2, the most common placenta position, the fundal anterior and posterior positions were most frequent, with 23 patients for each position. The fundal position was less frequent with 10 patients. The amount of amniotic fluid was categorised as normal, oligohydramnios and polyhydramnios. Seventy-eight patients had normal quantities of amniotic fluid; 3 patients had oligohydramnios fluid and 6 patients had polyhydramnios fluid.

**Table 1: Descriptive statistics for all patients**

variables	Mean	Std. Dev	Min	Max
age	29.88	6.451	16	43
FL/W	30.56	6.290	15	40
BPD/W	29.57	7.621	8	40
weight/Kg	2.193	1.053	0.19	7.20

**Table 2: Shows the frequency distribution of age group and placenta position**

Age group	Frequency	Percent	Placentaposition	Frequency	Percent
15-20	7	8.1	Fundal Posterior	23	26.7
21-25	18	20.9	Fundal Anterior	19	22.1
26-30	18	20.9	Anterior	23	26.7
31-35	26	30.2	Posterior	11	12.8
36-40	14	16.3	Fundal	10	11.6
41-45	3	3.5	Total	86	100.0
Total	86	100.0			

**Table 3: Shows the correlation between age group with placenta position**

Age Group	Placenta position					Total
	Fundal Posterior	Fundal Anterior	Anterior	Posterior	Fundal	
15-20	2	2	3	0	0	7
21-25	4	5	4	3	2	18
26-30	6	3	4	3	2	18
31-35	6	6	8	2	4	26
36-40	4	2	4	2	2	14
41-45	1	1	0	1	0	3
Total	23	19	23	11	10	86

**Table 4: Shows the analysis of variance for weight/g with FL/W and BPD/W**

		Sum of Squares	df	Mean Square	F	Sig.
FL/W	Between Groups	2764.209	68	40.650	1.154	.387
	Within Groups	599.000	17	35.235		
	Total	3363.209	85			
BPD/W	Between Groups	4026.081	68	59.207	1.105	.429
	Within Groups	911.000	17	53.588		
	Total	4937.081	85			

Table 3 reports the frequency of patient age group and placenta position. The positions of the placenta in the 26 patients in the age group 31-35 years were 6 fundal and 6 fundal posteriors, 8 anterior positions and 2 posteriors, 4 patients were fundal position.

Table 4 shows the analysis of variance for weight/g with FL/W and BPD/W. The p values reveal there is no significant difference between the baby's weight with measurement ( $p = 0.387$  and  $p = 0.429$  for FL/W and BPD/W respectively).

## CONCLUSION

Routine ultrasound screening was performed on 86, diabetic Saudi pregnant women, ranging from 16-43 years old. Descriptive statistics of patient data are presented as mean, standard deviation, minimum and maximum for patients age, FL per week, BPD per week, and weight per gram. For patients age, the mean  $\pm$  SD was  $29.88 \pm 6.45$  years, for FL/W and BPD/W was  $30.56 \pm 6.29$  and  $29.57 \pm 7.62$  respectively and for weight was  $2.193 \pm 1.053$  kg. Frequency distribution for age group and placenta

position, for the age group 31-35 was dominant with 26 patients than age group 21-25 and 26-30 years with 18 patients for each while the group 41-45 years was lower frequent with 3 patients.

The most common placenta position was fundal anterior and posterior, with 23 patients. Each fundal was less frequent with 10 patients. The amount of amniotic fluid was normal in 78 patients, while 3 patients had oligohydramnios and 6 had polyhydramnios.

A correlation was detected between the patient's age group with placenta position. Of twenty-six patients aged 31-35 years, the position of the placenta was fundal in 6 patients, fundal posterior in 6, anterior position in 8, posterior in two, and 4 patients were fundal position.

## CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

## ACKNOWLEDGEMENT

The researchers acknowledge that the project was fully

funded by the authors and that there are no conflicts of interest.

### AUTHOR CONTRIBUTIONS

A.M.O, study concept and supervision; L.H.H, data collection; S.A, wrote the final article and revised results; A.M.A., final revision of the article; M.E, edited the language and revised the article. All authors have read and agreed to the published version of the manuscript.

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