Journal of Pharmaceutical and Scientific Innovation
www.jpsionline.com
Research Article

PREGNANCY OUTCOME OF WOMEN WITH PREVIOUS CESAREAN SECTION ACCORDING TO PLACENTAL LOCATION IN FIRST TRIMESTER SONOGRAPHY

Mojgan Barati[1], Azam Malekghasemi[2]*, Razieh Mohammad Jafari[1], Sara Masihi[3], Najmieh Saadati[3], Farideh Maramazi[3]
[1]Associate Professor of Obstetrics and Gynecology, Fertility Infertility and Perinatology Research Center, Department of Obstetrics and Gynecology, Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran
[2]Resident of Obstetrics and Gynecology, Fertility Infertility and Perinatology Research Center, Department of Obstetrics and Gynecology, Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran
[3]Assistant Professor of Obstetrics and Gynecology, Fertility Infertility and Perinatology Research Center, Department of Obstetrics and Gynecology, Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran
*Corresponding Author Email: sahar_malekghasemi@yahoo.com
DOI: 10.7897/2277-4572.034163
Published by Moksha Publishing House. Website www.mokshaph.com

Received on: 15/06/14 Revised on: 30/07/14 Accepted on: 13/08/14

ABSTRACT
Moreover, the first trimester ultrasonography provides a valuable evaluation for predicting pregnancy outcomes. Our purpose was to determine whether ultrasonography of placental location at 11-14 weeks of gestation (first trimester) can predict neonatal and maternal pregnancy outcomes. The observational and prospective study from July 2011 to October 2012 was conducted on the 200 pregnant women with previous cesarean. Placental locations were determined by ultrasonography at 11-14 weeks' gestation, and then were classified into four groups including anterior high, anterior low, posterior high and posterior low. Parameters such as Preterm Labor, Preterm Premature Rupture of Membrane, neonatal Birth Weight, occurrence of bleeding throughout pregnancy were followed up. Our results showed that the anterior low group had highest rate of bleeding throughout pregnancy compared with groups of posterior low, anterior high and posterior high (40 %, 34 %, 4 %, 6 %, respectively, $p <= 0.001$); furthermore, there was significant correlation between rising the number of previous cesareans and increasing the incidence of the anterior low placental implantation (P value = 0.03). Anterior low group had lowest average of neonatal birth weight (p-value < 0.001), while anterior high group had highest average of neonatal birth weight compared with other groups. We believe that the ultrasound procedure was valid and enabled us to evaluate the pregnancies at first stages of pregnancy (11-14 weeks). Therefore, it can be used in evaluating the pregnancies to categorize them as being at risk for an adverse ante partum, intra partum and neonatal outcomes.
Keywords: First Trimester, Pregnancy, Ultrasonography, Cesarean Section, Pregnancy Outcome, Placental Site.

INTRODUCTION

Recently, an ultrasound is routinely performed to evaluate fetal anatomy, amniotic fluid, and gestational age in most pregnant women. In addition to these evaluations, the placental location is also assessed[1]. Due to the risk of unacceptable bleeding during the vaginal delivery, cesarean section is considered in the cases of placenta previa, marginal placental separation or low-lying placenta if persistent until late stages in pregnancy. However, the importance of placental locations is still unknown and unexplored[2]. An increased risk of postpartum hemorrhages is expected in low-lying placenta (implantation in the lower uterine segment)[3]. There is a relationship between unilateral placental implantations (the bulk of placenta is implanted over the left or right side of uterus) and higher risk of preeclampsia[4,5]. Moreover, it has been shown that breech presentations in pregnant women are associated with corneal placental implantation[6]. Also, placenta previa increases the risk of some adverse pregnancy outcomes such as placental abruption, fetal growth restriction, and bleeding during third trimester[7]. The first trimester in pregnancy is one of the most fascinating periods for human development. Moreover, the first trimester ultrasonography provides a valuable evaluation for predicting pregnancy outcomes. Therefore, due to the probable relationship between placental locations and pregnancy outcomes, it is important to assess the pregnancy outcomes in the early stages of pregnancy. Studies which had evaluated the role of ultrasonography of placental locations in predicting neonatal and maternal outcomes mostly had assessed the value of ultrasonography in the second or third trimester. To date, there is no specific study regarding first trimester evaluation. Our purpose was to determine whether by ultrasonography of placental location at 11-14 weeks of gestation (first trimester) can predict neonatal and maternal pregnancy outcomes.

MATERIAL AND METHODES

The observational and prospective study from July 2011 to October 2012 was conducted on the 200 pregnant women with previous cesarean. Participants were referred to the perinatology clinic for the first trimester sonography in Imam Khomeini Hospital (a general, referral and tertiary university affiliated hospital), Ahvaz, Iran. All sonographic examinations performed by just one gynecologist trained in ultrasound and by just one sonography instrument with trans abdominal convex probe 3.5 HZ (Accuvix V10 Ob/Gyn Ultrasound System, manufactured by Samsung MEDISON Co., Korea) at 11-14 weeks' gestation. Placental locations were classified into four groups including anterior high, anterior low, posterior high, and posterior low. In other words, the uterus was considered four major segments, then anterior low was attributed to placental implantation in the anterior wall and in lower segment, posterior low was attributed to placental implantation in the lower segment of posterior wall, anterior high was related to placental implantation in the upper segment of anterior wall, and finally posterior high was dedicated to placenta implantation in the upper part of posterior wall. Then, according to the placental location, the incidence of Parameters such as Preterm Labor (PTL = delivery before 37 weeks of gestation), Preterm Premature Rupture of Membrane (PPROM = rupture of membranes before beginning of labor

and before 37 weeks), neonatal Birth Weight (BW) and occurrence of bleeding throughout pregnancy (in the first, second and third trimesters) were assessed. All the patients that include the study had Singleton pregnancies at 11-14 weeks of gestation (based on Last Menstrual Period) with at least one previous cesarean section. Patients were excluded if they have uterine myomas, uterine or genital anomaly, and history of underlying medical disease. All participants fully completed the study (we had not any missing data). In addition, All 200 patients were followed up 30 days after delivery to gather data about delivery outcomes. Ethical approval was gained from the Ethics Committee of the Department of Obstetrics and Gynecology. The ethical approval code is AJUMS.REC.1392.61. Participants' informed consent was gained; voluntary participation and confidentiality were guaranteed. Because there was no previous similar study, we conducted a pilot study and then a sample size of 45 for each group was estimated using following formula to have the power of 90 %. We would consider the loss to follow up rate to be 10 % of estimated sample size. Accordingly, we included 50 cases in each group. The criterion for significance (alpha) was set at 0.05, 2-tailed, so that an effect in either direction will be interpreted.

$$n = 2\frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 \overline{pq}}{\left(p_1 - p_2\right)^2}$$

Data were analyzed using SPSS 17.0. The descriptive statistics were utilized to describe four groups. The p-value less than 0.05 considered as significant.

RESULTS

The patients were classified into 4 groups based on placental sonography (each group 50 cases). Table 1 shows demographic characteristics of participants. Our results showed that the anterior low group had highest rate of bleeding throughout pregnancy compared with groups of posterior low, anterior high, and posterior high (40 %, 34 %, 4 %, 6 %, respectively, p < = 0.001); furthermore, there was significant correlation between rising the number of previous cesareans and increasing the incidence of the anterior low placental implantation (P value = 0.03). In the anterior low group, also the risk of PTL (P value = 0.7) and PPROM (P value = 0.3) were higher than other groups but the differences were not significant. The number of cases with three previous cesareans in the anterior low, anterior high, posterior high and posterior low was 5, 1, 2, and 2 cases, respectively; whereas, the cases with history of two cesareans in groups of anterior low, anterior high, posterior high and posterior low were 12, 2, 3 and 10, respectively. Figure 1 and 2 represents the mean of neonatal birth weight and incidence of previous cesareans in the four groups. Anterior low group had lowest average of neonatal birth weight (p-value < 0.001), while anterior high group had highest average of neonatal birth weight compared with other groups. Among all participants, one case reported the history of cesarean hysterectomy which belongs to the anterior low group. Pregnancy outcomes are summarized in the Table 2.

Table 1: Characteristics information of participants

	Post low	Ant low	Ant high	Post high	P-value
Mother's age (mean ± SD)	31.58 ± 2.8	30.88 ± 3.08	31.68 ± 3.13	30.62 ± 2.6	0.1
Gravidy Age (week)	38.1 ± 1.7	37.5 ± 2.7	38.08 ± 1.96	37.6 ± 2.4	0.4

Table 2: The results of four groups of study including posterior low, anterior low, anterior high, and posterior high

Characteristics		Post low (n = 50)	Ant low (n = 50)	Ant high (n = 50)	Post high (n = 50)	P-value
Mean of BW		3309.5 ± 352.7	2980.3 ± 537.2	3578.6 ± 488.9	3547.4 ± 674.4	< 0.0001
PCS	1	38 (23.3 %)	33 (20.2 %)	47 (28.8 %)	45 (27.6 %)	0.007
	2	10 (37.0 %)	12 (44.4 %)	2 (7.4 %)	3 (11.1 %)	
	3	2 (20 %)	5 (50 %)	1 (10 %)	2 (20 %)	
Bleedings		17(40.4 %)	20(47.6 %)	2 (4.7 %)	3(7.3 %)	0.001
PTL		6 (25 %)	8 (33.3) %	5 (20.8) %	5 (10 %)	0.7
PPROM		1 (7.1 %)	5 (35.7 %)	3 (21.4 %)	5 (35.7 %)	0.3
Hysterectomy		1 (100 %)	0 %	0 %	0 %	
BW: Birth Weight, PCS 1, 2, and 3: Number of Previous Cesarean Sections, PTL: Preterm Labor, PPROM: Preterm Premature Rupture of Membrane						

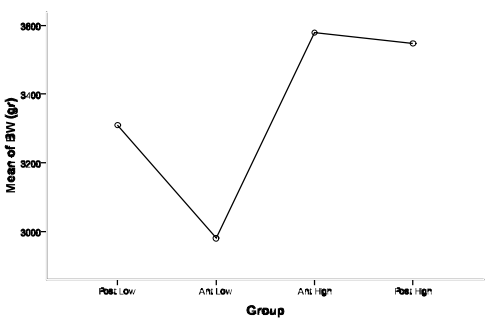

Figure 1: The mean of neonatal birth weight in four groups

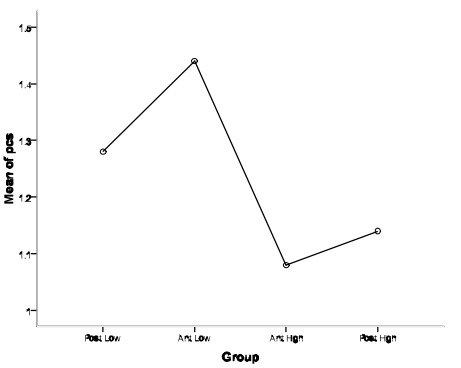

Figure 2: The mean of previous cesareans in four groups

DISCUSSION

Recently, the pregnancy ultrasound evaluation is performed in the majority of pregnant women for assessing gestational age, amniotic fluid and fetal anatomy, also the placental implantation site is reported, but no further attention is paid to that with the exception of placenta previa, marginal and low-lying (the placenta over or near the internal cervical os) due to the risk of bleeding. Although, a question is raised regarding whether other placental locations are important or they can be considered as the predictive of pregnancy outcomes[3-8].

In our study, the anterior low group had highest rate of bleeding throughout pregnancy compared with groups of posterior low, anterior high, and posterior high (40 %, 34 %, 4 %, 6 %, respectively, $p <= 0.001$); in addition, there was significant correlation between rising the number of previous cesareans and increasing the incidence of the anterior low placental implantation (P value = 0.03). Lieberman *et al*. reported the reduced risk of developing preeclampsia with the placenta previas[8]. Besides, an increased risk of preeclampsia with unilateral placental implantation was reported by Gosner *et al*[5]. Some other studies showed an increased risk of preeclampsia with unilateral placental implantation[5,8].

In a study done by Fianu and *et al*., have shown that an abnormal presentation was not influenced by placental site. Moreover, no more breech presentation was reported with corneal implantation compared with lateral implantations[6]. Although in Magann's study the breech presentation was associated with the corneal implantation[1]. We found that anterior low group had lowest average of neonatal birth weight (2980.3 ± 537.2, 3578.6 ± 488.9, respectively, p-value < 0.001), while anterior high group had highest average of neonatal birth weight compared with other groups. In Megann's study the risk of having fetus with IUGR was not correlated with the site of placental implantation[1]; although, Vaillant and *et al*, in a study reported the increased risk of IUGR for high lateral placental implantations[4].

The findings by Magann's study support our observations about higher birth weight in anterior high placental location. They estimated more birth weight for the neonates with high placental implantation locations (as our study that showed more average of neonatal birth weight in ant high placental implantation), the theory behind their findings was that the implantation near the uterine and ovarian arteries might receive more blood flow than the other implantation sites, and this could be account for the larger neonates with unilateral placentas[1].

Kalanati and *et al*, in their study showed a relationship between lateral placental implantation in second trimester with more IUGR fetuses[9].

We showed that the risk of PTL (P value = 0.7) and PPROM (P value = 0.3) were higher in the anterior low group in compared to other groups but the differences were not significant. These findings are supported by investigation of Seadati and *et al*. They concluded that second trimester sonographies reported more preterm labors in the group of the low placental implantation[10].

However, the results of Devarajan' s study reported no differences in newborn weight or other prenatal outcomes associated with placental location[11]. Non-central placental implantation in the second trimester of pregnancy is linked with some adverse pregnancy outcomes in the Fung *et al*. investigation at 2011[12].

Michael and Bettina in their study at 2011 reported the more risk of fetal loss in the patients with vaginal bleeding that by first trimester ultrasound had viable intrauterine fetuses[13]. Yang *et al*., in a case report at 2009 showed a case with previous cesarean section which by first trimester ultrasound diagnosed her placenta accrete; so enabled earlier planning of appropriate treatment[14].

Our results regarding number of previous cesareans are shown in Figure 2. As have been shown, highest number of previous cesareans was in the anterior low group.

CONCLUSION

We believe that ultrasound procedure was valid and enabled us to evaluate pregnancy outcomes. Placental implantation sonography at 11 to 14 weeks can be used in evaluating the pregnancies to categorize them as being at risk for an adverse ante partum, intra partum and neonatal outcomes.

In our study the anterior low placental implantation was related to higher pregnancy bleedings, lower neonatal birth weight and more repetition of previous cesarean sections. If these observations in the future investigations remain valid, then the placental implantation site on the first trimester targeted ultrasound can be used to label a pregnancy as at risk and follow up ultrasounds or other surveillance techniques might be used to ensure the best pregnancy outcome.

ACKNOWLEDGMENT

This paper is issued from thesis of Dr Azam Malekghasemi and financial support was provided by Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran.

REFERENCES

1. Magann EF, Doherty DA, Turner K, Lanneau GS Jr, Morrison JC, Newnham JP. Second trimester placental location as a predictor of adverse pregnancy outcome. Journal of Pre Antilogy 2007; 27: 9-14.
2. Bhide A, Perfume F, Moore J, Hollis B, Thilanganathan B. Placental edge to Internal Os distance in the late third trimester and mode of delivery in placenta previous. BJOG: An International Journal of Obstetrics and Gynaecology 2003; 110: 860-4. http://dx.doi.org/10.1111/j.1471-0528.2003.02491.x
3. Bobrowski R, Jones T. A thrombogenic uterine pack for postpartum hemorrhage. Obstet Genicol 1995; 85: 836-7. http://dx.doi.org/10.1016/0029-7844(94)00231-2
4. Vaillant P, Best M, Cynober E, Devulder G. Pathological uterine readings when the placenta is laterally situated. J Gynecol Obestet Biol Reprod 1993; 22: 301-7.
5. Gonser M, Tillack N, Pfeiffer K, Mielke G. Placental location and incidence of preeclampsia. Ultraschall med 1996; 17: 236-8. http://dx.doi.org/10.1055/s-2007-1003188
6. Fianu S, Vaclavinkova V. The site of placental implantation as a factor in the etiology of breech presentation. Acta Obstetr Gynecol Scand 1978; 57: 371-2. http://dx.doi.org/10.3109/00016347809154033
7. Newton E, Barass VC, Etrulo C. The epidemiology and clinical history of asymptomatic mid trimester plasenta previa. Am J Obstet Gynecol 1984; 148: 743-8. http://dx.doi.org/10.1016/0002-9378(84)90559-3
8. Lieberman J, Fraser D, Kasis A, Mazor M. Reduced frequency of hypertensive disordering placenta previous. Obstet Gynecol 1991; 77: 836-9.
9. Kalanithi LE, IIIuzzi JL, Nossov VB, Frisbeak Y, Abdel Razeq S, Copel JA, Norwitz ER. Intrauterine growth restriction and placental location. J Ultrasound Med 2007; 26(11): 1481-9.
10. Seadati N, Najafian M, Cheraghi M, Mohammadi B. Placental location at second trimester and pregnancy outcomes. J Pharm Sci Innov 2013; 2(2): 32-4. http://dx.doi.org/10.7897/2277-4572.02211
11. Devarajan K, Kives S, Ray G. Placental location and new born Weight. J Obstet Gynaecol Can 2012; 34(4): 325-9.
12. Fung TY, Sahota DS, Lau TK, Leung TY, Chan LW, Chung TK. Placental site in the second trimester of pregnancy and its association with subsequent obstetric outcome. Prenat Diagn 2011; 31(6): 548-54. http://dx.doi.org/10.1002/pd.2740
13. Michael L Juliano and Bettina M Sauter. Fetal outcome in first trimester pregnancies with an indeterminate ultrasound. J Emerg Med 2011; 1-6.

14. Yang JI, Kim HY, Kim HS, Ryu HS. Diagnosis in the first trimester of placenta accreta with previous cesarean section. Ultrasound Obstet Gynecol 2009; 34(1): 116-8. http://dx.doi.org/10.1002/uog.6407

Source of support: Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran, Conflict of interest: None Declared

QUICK RESPONSE CODE	ISSN (Online) : 2277 –4572
	Website http://www.jpsionline.com

How to cite this article:
Mojgan Barati, Azam Malekghasemi, Razieh Mohammad Jafari, Sara Masihi, Najmieh Saadati, Farideh Maramazi. Pregnancy outcome of women with previous cesarean section according to placental location in first trimester Sonography. J Pharm Sci Innov. 2014;3(4):315-318 http://dx.doi.org/10.7897/2277-4572.034163