International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

Miscarriage in First Trimester: Risk Factors and Sonographic Assessment in Sudanese Pregnant Women

Mowada Burai[1,2], Moawia Gameraddin[1], Razaz Yahya[2]

[1]Department of Diagnostic Radiologic Technology, Faculty of Applied Medical Sciences, Taibah University, KSA.
[2]Faculty of Radiological Sciences and Medical Imaging, Al-zaiemAlazhari University, Khartoum, Sudan.

Corresponding Author: Mowada Burai

Received: 30/11/2016 *Revised: 09/01/2017* *Accepted: 13/01/2017*

ABSTRACT

Background: Miscarriage has been still a health problem in pregnancy which caused by various factors. Ultrasound plays effective in assessment. The study aims to identify the risk factors and to assess the various types of miscarriage using ultrasound.
Methods: This is a descriptive prospective cross-sectional study conducted from March to August 2016. A total of 200 Sudanese pregnant were scanned with ultrasound, transabdominally and transvaginally to evaluate the embryo and gestational sac in the first trimester using 3.5 MHz and 5-7 MHz probes. Data collection sheet was designed to include the risk factors and demographic data.
Results: A total of 200 women in first trimester were evaluated with ultrasound, with 27% diagnosed with incomplete miscarriage, 18.5% with complete miscarriage, 15% missed abortion, 5% threatened abortion, 5% blighted ovum, 2.5% molar pregnancy, 1.5% inevitable abortion and 1%ectopic pregnancy. History of miscarriage is the main risk factor of miscarriage (34%), while obesity is the second risk factor (9%), thyroid diseases 2%, and contraceptive pills 1.5%. Miscarriage mainly affects the maternal age group 20-30 years (62%).
Conclusion: Several and variable risk factors associated with miscarriage in first trimester of pregnancy. History of miscarriage and obesity were the most common risk factors of miscarriage. Sonographic assessment of miscarriage concluded that incomplete miscarriage, complete miscarriage and missed miscarriage were the common types of miscarriage.

Key Words: Miscarriage, First trimester, Sudanese pregnant women.

INTRODUCTION

Miscarriage is represent one of the most serious health problem in pregnant women and community-based problem. Most previous studies reported that one in five pregnant women end in miscarriage. [1,2] Other prospective studies had reported fetal loss rates were approximately one-third. [3,4] There are many factors contributing to miscarriage and they were regarded as well-established and controversial risk factors. The well-established risk factors include: increased maternal age. [5,6] history of abortion and infertility. [7,8] In our region, these factors may show some differences and might not be the same as demonstrated in the previous studies since there were many factors that were variable.

There are different types of miscarriage depending on cause and stage of pregnancy. Miscarriage is ordinary classified as incomplete or complete, threatened and inevitable, on the basis of clinical history and findings of digital pelvic

examination. [9] The purpose of the study is to determine these types and to identify the risk factors in the first trimester. Ultrasound plays effective role in detection and evaluation of miscarriage and display a variety of sonographic appearances according to the stage of miscarriage.

MATERIALS AND METHODS

A prospective descriptive cross-sectional design was used to evaluate the complications of pregnancy (miscarriage) in the first trimester of pregnancy. The study conducted in Khartoum state from the period of March to August 2016.Data collection sheet was designed to include demographic data and clinical history of the patients. A total of 200 women in first trimester were evaluated using transabdominal and transvaginal sonography. Exclusion criteria included uterine malformations and history of fetal anomalies.

Scanning procedure

Ultrasound equipments used for data collection included: Sonoscape ultrasound diagnostic system, model A5, manufactured on China on January 2012, with Tansabdominal probe (3.5 to 5MHz).Toshiba power vision 6000 ultrasound diagnostic system, Model: SSA-370A , manufactured on Japan 2000, with 3.5 to 5 MHz convex Transducer.

The patients were scanned in supine position. A coupling gel was applied to ensure good transmission of the sound beam and to avoid artifacts. For transabdominal procedure, the patients were examined in supine position through full urinary bladder, and applying adequate amount of gel, transducer (3 to 5 MHz) was placed in contact with the skin above to the symphysis pubis.Then longitudinal and transverse planes were obtained through the uterus to assess the embryo and gestational sac (GS).With transvaginal procedure, we used 5 to 10MHz probes. The patients should empty the bladder and lies in supine with her buttock on the tip of the table, legs flexed on the thigh and abducted, small amount of gel was applied to the tip of the transducer then probe was inserted into vagina. Sagittal and coronal planes were obtained through the uterus to assess the embryo and the GS. Complications were evaluated and documented.

***Statistical analysis*:** The data was analyzed using statistical package for social sciences (SPSS). We used descriptive statistics to describe the data.

RESULTS

The mean age was 22 ± 3 years. The distribution of age was shown in table 1 and it was observed that the age group 20 – 30 years was the highest frequent (62%). The gestational age (GA) was shown in table 2 and it was noted that the majority of pregnant were in 8 – 13 weeks of gestation (79%). The Frequency distribution of parity was revealed in table 3. The prevalence of risk factors of miscarriage was identified in table 4 and it was observed that history of miscarriage was the highest frequent risk factor (34%), then obesity (9%), diabetes (2%), thyroid diseases (2%) and contraceptive pills (1.5%). The final sonographic assessments of miscarriage were shown in table 5. It was observed that incomplete miscarriage was the most common type (27%), then complete miscarriage (18.5%), threatened miscarriage (5%), blighted ovum (5%), molar pregnancy (2.5%), inevitable miscarriage (1.5%) and ectopic pregnancy (1%).

Table 1: Frequency distribution of the age groups

Patient age	Frequency	Percent
< 20 years	12	6%
20 – 30 years	124	62%
31 – 40 years	55	27.5%
> 40 years	9	4.5%
Total	200	100.0%

Table 2: Frequency distribution of the gestational age

gestational age	Frequency	Percent
> 8 weeks	42	21%
8 – 13 weeks	158	79%
Total	200	100.0%

Table 3: Frequency distribution of parity status.

Parity	*Frequency*	*Percent*
P 0-1	*92*	*46%*
P II-V	*92*	*46%*
P>V	*16*	*8%*
Total	*200*	*100.0%*

Table 4: The risk factors of miscarriage at the first trimester

Risk factors	Frequency	Percent
Norisk factors	83	41.5%
History of miscarriage	68	34%
Obesity	18	9 %
Diabetic	4	2%
Thyroid diseases	4	2%
Contraceptive pills	3	1.5%
Total	200	100.0%

Table 5: types of miscarriage that had been evaluated with ultrasonography

Ultrasound findings	Frequency	Percent
Normal Pregnancy	49	24.5%
Incomplete miscarriage	54	27%
Complete miscarriage	37	18.5%
Missed miscarriage	30	15%
Threatened miscarriage	10	5%
Blighted ovum	10	5%
Molar Pregnancy	5	2.5%
Inevitable miscarriage	3	1.5%
Ectopic pregnancy	2	1%
Total	200	100.0%

DISCUSSION

Determination of miscarriage with ultrasound remains a challenge, especially in suspected ectopic pregnancy. In this study we have evaluated the sonographic findings of miscarriage and the risk factors. It was observed that miscarriage was mostly common in the age group of 20-30 years. This finding showed differ from other studies and consistent with others. Elise and Patrick studied maternal age as risk factor for miscarriage in European community and they reported that the risk of miscarriage was higher in women were aged ≥35 years. [10] This was not consistent with our result since the study population was different in ethnicity, environment and nutrition. These factors may play significant role that might influence miscarriage. The current study revealed other important risk factors among which the history of miscarriage is the dominant one (34%). Several previous studies reported that history of miscarriage was strongly associated with the incidence of miscarriage. Eric et al., reported that family history of recurrent miscarriage is a significant factor to be investigated [11] and this was consistent with our result. In literature, the uterine malformations and chromosomal aberration were the most common causes of miscarriage. [12] In our study, chromosomal abnormalities were not included and uterine anomalies were excluded. In the current study, obesity is the second risk factor that results in miscarriage. In previous study, a controversion emerged whether it was a risk factor or not. Lashen et al. reported that obesity is a prominent factor associated with increased risk of recurrent miscarriage. [13] Our finding agreed with Lashen et al. The study revealed that obesity, diabetes, thyroid diseases and contraceptive pills were less frequent risk factors associated with miscarriage according to the study population.

The ultrasound examination plays a vital role to assess and characterize miscarriage. In the present study, ultrasound characterized various kinds of miscarriage. It was observed that incomplete abortion was the most common type of abortion while complete miscarriage is second and missed miscarriage is the third. Incomplete abortion is defined by the presence of retained products of conception that always appeared echogenic with irregular gestational sac (GS). But complete abortion is defined when ultrasound revealed empty uterine cavity without evidence of embryonic tissue or GS. [14]

In the current study, threatened abortion is the third common form (10 %) that had been detected with ultrasound. In literature, threatened miscarriage is commonest complication occurs in pregnancy and accounted about a fifth of cases. [15] Our result is mainly agreed with this finding that threatened miscarriage is the third common complication of pregnancy in this study population. Sonographically, threatened miscarriage is suspected when there were small GS, abnormal yolk sac and bradycardic fetal heart rates. [16]

In present study, anembryonic pregnancy, which is called blighted ovum, accounts 5% of the cases. On ultrasound, blighted ovum appears as an empty GS without evidence of embryonic tissue or parts. Other types of miscarriage were molar pregnancy, inevitable miscarriage and ectopic pregnancy which were less frequent

in this study. In previous studies, ectopic pregnancy was strongly associated with the use of intrauterine contraceptive device, but both ectopic and molar pregnancies were associated with advanced maternal age. [17, 18]

CONCLUSION

There were variable types of miscarriage with different risk factors that complicated pregnancy in the first trimester. History of previous miscarriage is considered a main risk factor. Obesity is the second risk factor while diabetes and thyroid diseases were the third one. Sonographic evaluation of miscarriage revealed that incomplete abortion is the main type, while complete miscarriage is second and missed miscarriage is the third. Ultrasound plays a vital role to characterize miscarriage.

REFERENCES

1. Garcia-Enguidanos A, Calle ME, Valero J, Luna S, Dominguez-Rojas V.Risk factors in miscarriage: a review. Eur J ObstetGynecolReprodBiol2002; 102:111–19.
2. Savitz DA, Hertz-Picciotto I, Poole C, Olshan AF. Epidemiologic measuresof the course and outcome of pregnancy. Epidemiol Rev 2002;24:91–101.
3. Zinaman MJ, Clegg ED, Brown CC, O'Connor J, Selevan SG. Estimates of human fertility and pregnancy loss. FertilSteril 1996; 65:503–9.
4. Wilcox A, Weinberg C, O'Connor J, Baird DD, Schlatterer JP, CanfieldRE, et al. Incidence of early loss of pregnancy. N Engl J Med 1988; 319:
5. Nybo Andersen A-M, Wohlfahrt J, Christens P, Olsen J, Melbye M.Maternal age and fetal loss: population based register linkage study.BMJ 2000; 320:1708–12.
6. De la Rochebrochard E, Thonneau P. Paternal age and maternal age arerisk factors for miscarriage; results of a multicentre European study.Hum Reprod 2002; 17:1649–56.89–94.
7. Hakim RB, Gray RH, Zacur H. Infertility and early pregnancy loss. Am JObstetGynecol 1995; 172:1510–17.
8. Axmon A, Hagmar L. Time to pregnancy and pregnancy outcome.FertilSteril 2005; 84:966–74.
9. DavorJurkovic, Caroline Overton, Ruth Bender-Atik. Diagnosis and management of first trimester miscarriage.BMJ 2013; 346:34-35.Available from: http://www.bmj.com/bmj/section-pdf/187929?path=/bmj/346/7913/Clinical_Review.full.pdf . Accessed on 1 November 2016.
10. Elise de La Rochebrochard and Patrick Thonneau. Paternal age and maternal age are risk factors for miscarriage; results of a multicentre European study. Hum. Reprod. 2002; 17: 1649-1650.
11. Eric Jauniaux, Roy G. Farquharson, Ole B. Christiansen and NiekExalto. Evidence-based guidelines for the investigation and medical treatment of recurrent miscarriage. Hum. Reprod. 2006; 21 (9): 2216-2217.
12. A García -Enguídanos , M.E Calle, J Valero, S Luna. Risk factors in miscarriage: a review. European journal of obstetrics and gynecology and reproductive biology. 2002; 102(2):111–112.
13. H. Lashen1, K. Fear2 and D.W. Sturdee. Obesity is associated with increased risk of first trimester and recurrent miscarriage: matched case–control study. Hum. Reprod. 2004; 19 (7): 1644-1645.
14. DavorJurkovic, Caroline Overton, Ruth Bender-Atik. Diagnosis and management offirst trimester miscarriage. BMJ 2013; 346:f3676.
15. AlexandrosSotiriadis, Stefania Papatheodorou, and George Makrydimas, Threatened miscarriage: evaluation and management.BMJ. 2004; 329(7458): 152–153.
16. Falco P, Milano V, Pilu G et al: Sonography of pregnancies in with first trimester bleeding and a viable embryo: A study of prognostic indicators by logistic regression. Ultrasound Obstet Gynecol.1996; 7: 165.Available from: https://www.glowm.com/section_view/heading/Diagnostic Ultrasound in the First Trimeste
17. Bouyer J, Coste J, Shojaei T, Pouly JL, Fernandez H, Gerbaud L, et al. Risk

factors for ectopic pregnancy: a comprehensive analysis based on a large case–control, population-based study in France. Am J Epidemiol. 2003; 157(3):185–94.

18. Makinen JI. Increase of ectopic pregnancy in Finland--combination of time and cohort effects. Obstet Gynecol. 1989; 73(1):21–4.

How to cite this article: Burai M, Gameraddin M, Yahya R. Miscarriage in first trimester: risk factors and sonographic assessment in Sudanese pregnant women. Int J Health Sci Res. 2017; 7(2):52-56.

****