

Yolk Kesesinin Boyutu Düşüğü Öngörebilir Yolk Sac Size Can Predict Miscarriage

ÖZET

Amaç: Yolk kesesinin boyutuna ve yolk kesesinin boyutunun gebelik kesesinin boyutuyla ilişkisine bakarak düşüğün öngörülüp görülemeyeceğini belirlemek.

Gereç ve Yöntemler: Gebelik kesesi, yolk kesesi ve baş-popo uzunluğu ölçümleri kaydedildi. Bütün hastalar terme kadar takip edildi ve 20. gebelik haftasından önce kalp atımları duranlar kötü gebelik sonucu olarak gruplandırıldı. Düşükle sonlanan hastalar ile terme kadar devam edenlerin ölçülen özellikleri karşılaştırıldı.

Bulgular: 88 hastanın ölçümleri yapıldı. Dört hasta 20. gebelik haftasından önce düşük yaptı. Çalışmamızda yolk kesesi çapının 95. persentilin üzerinde olmasının düşük için %33,3 duyarlılık, %80 özgüllük, %5,6 pozitif kestirim değeri ve %78,4 negatif kestirim değeri olduğu saptandı; 4,6 mm üzerinde ölçülen yolk kesesi çapı 20.gebelik haftasından önce düşük yapma riskiyle ilişkili bulundu.

Sonuçlar: Büyük yolk kesesi düşüğü öngörebilir. Yolk kesesi büyük ölçülen hastalara 2 hafta içerisinde ultrason tekrarı önerilmelidir. Bu ölçümler normal dışı olduğunda sonuçları hastayla paylaşmak gereksiz anksiyete yaratabilir. Ultrason sayısını azaltmak için sadece normal bulunan sonuçların kullanılmasını öneriyoruz.

Anahtar Kelimeler: Yolk kesesi, düşük, ultrason

ABSTRACT

Objective: To identify the role of yolk sac size and its association with gestational sac size in predicting miscarriages.

Methods: Measurements of the gestational sac diameter, yolk sac diameter and crown-rump length were recorded. All of the patients were followed until term and those with loss of cardiac activity before 20th week of pregnancy were classified in the adverse pregnancy outcome group. We compared the measured characteristics of pregnancies with miscarriage and ongoing pregnancies reaching term.

Results: We followed 88 pregnancies. Four patients miscarried before the 20th week of pregnancy. A yolk sac diameter greater than the 95th percentile had a sensitivity of 33.3%, specificity of 80%, positive predictive value of 5.6% and negative predictive value of 78.4% for miscarriage. A yolk sac diameter greater than 4.6mm was associated with miscarriage before the 20th week of pregnancy.

Conclusions: An enlarged yolk sac may be predictive of a future miscarriage. Patients with an enlarged yolk sac should be offered a new ultrasound within 2 weeks. Sharing the results of an abnormal ultrasonography with the patient may create unnecessary anxiety. We only advise to use the favorable results as a reassuring sign to decrease the number of ultrasonographies.

Keywords: Yolk sac, miscarriage, ultrasound

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Introduction

About one-third of the implanted pregnancies result with spontaneous abortion in the early first trimester.¹ The inability to visualize the yolk sac until the 32nd day of fertilization was reported to be associated with the absence of embryonic heart motion.² With the detection of embryonic cardiac activity, rate of spontaneous abortion decreases to 3-4%.^{1,3} Yolk sac is the primary source of exchange between the embryo and maternal circulation before the establishment of placentation. It can be easily visualized between the 5th and 12th weeks of pregnancy. It was proposed as a prognostic factor in the determination of pregnancy outcome.⁴ The aim of this study was to prospectively evaluate the role of yolk sac size and its association with gestational sac size in miscarriages.

Materials and Methods

This is a prospective study conducted in our gynecology outpatient clinic between January and October 2011 with data obtained from routine obstetric measurements of the patients. The study protocol is in accordance with the guidelines of Declaration of Helsinki. We performed transvaginal ultrasound (NG and HI) to all pregnant with Voluson 730 (GE medical systems) at their initial antenatal visit. We excluded pregnancies with known uterine anomalies, multiple pregnancies, pregnant with vaginal bleeding and also anembryonic pregnancies. We measured the gestational sac diameter (GSD), yolk sac diameter (YSD) and crown-rump length (CRL) in all pregnant presenting before the 10th week of gestation. We measured the YSDs by placing the calipers on the middle of the wall at the largest diameter, than the percentiles were calculated. We took the mean of three measurements to determine the YSD and GSD. All of the patients were followed until term and those with loss of cardiac activity until the 20th week of pregnancy were classified in the adverse pregnancy outcome group. All of the missed abortions occurred in the first trimester of pregnancy. We compared the characteristics of pregnancies with miscarriage and ongoing pregnancies reaching term. Patients with habitual abortion were excluded but we did not take the number of previous pregnancies and abortions into consideration.

For statistical analyses of the data we used software package SPSS15.0 (SPSS, Chicago, USA). Descriptive data were presented as means for continuous variables and number for categorical variables. Pearson Chi-square test was used to compare the categorical variables. Multivariate regression analyses were

used to find out the impact of other factors. A p-value <0.05 was considered as statistically significant.

Results

We recruited 88 patients. The mean maternal age was 31.3 ± 4.5 years (range 20 to 43 years). The mean gravidity was 1.76 ± 0.4 (range 1-5), the mean parity was 0.35 ± 0.5 (range 0-4), the mean abortus number was 0.1 ± 0.4 (range 0-4). The mean gestational age during the ultrasound examination was 51.3 ± 7.3 days (range 41-69 days). The mean GSD was 25.9 ± 10.3 mm (range 12.2-53.0 mm). The mean YSD was 4.2 ± 0.9 mm (range 1.0-7.2 mm). The mean CRL was 6.7 ± 1.4 mm (range 2.5-29.0 mm). The YSDs of patients that resulted in abortion were 3.1 mm, 7.2 mm, 3.6 mm and 4.0 mm. Chromosomal analysis of abortion material revealed Down syndrome in one of the cases, the other three had normal genetic analysis. A YSD greater than the 95th percentile had a sensitivity of 33.3%, specificity of 80%, positive predictive value of 5.6% and negative predictive value of 78.4% for miscarriage. On the other hand the receiver operating characteristic curve analysis for YSD demonstrated a cut-off point of 4.6 mm for miscarriage, a YSD greater than 4.6 mm had a higher risk of pregnancy-loss. A YSD larger than 4.6 mm had a sensitivity of 71.4%, specificity of 71.9%, positive predictive value of 38.4% and negative predictive value of 91.1% for miscarriage.

The ratio of YSD to GSD was calculated, but it was not predictive of miscarriage, LR=1

(Figure 1). The Pearson Chi-square test did not reveal a relationship between the demographic factors including maternal age.

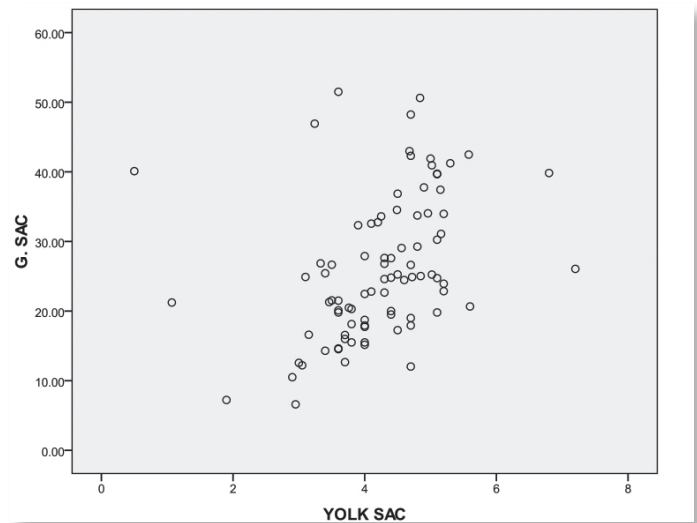


Figure 1. The relationship between gestational and yolk sac diameter.

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Discussion

This study demonstrated the role of increased YSD for miscarriage. The YSD increased as the gestational age advanced, therefore we used the previously determined percentiles and we searched the prognostic role of YSD percentiles above the 95th and below the 5th percentiles. One fourth of our patients with miscarriage had a YSD above the 95th percentile. On the other hand only one of ten patients reaching the 20th week of pregnancy had a YSD above the 95th percentile. Previously both higher and lower rates were reported.⁵⁻⁹ The discrepancies between the studies may be a result of different ultrasonographic measurement methods, inner to inner and middle to middle placement of the calipers.¹⁰ The largest yolk sac that resulted in a live birth was reported as 8.1 mm.¹¹, in our study the largest YSD in a live fetus was 6.8 mm. The largest YSD that we have measured was 7.2 mm. Similar to the recent reports we also demonstrated that a YSD greater than 4.6 mm had a higher risk of pregnancy-loss.¹² None of our patients with a YSD less than the 5th percentile miscarried. Previously both large and small YSD was reported to be associated with miscarriage.¹³ A recent study investigating the association between the enlarged YSD and abnormal embryonic karyotype revealed that nearly all of the patients had trisomy 22.¹⁴ It is known that the defects in chromosome 22 cause morphological abnormalities in the circulatory system.¹⁵ Early developmental failure of the anatomical structures related to fetal heart-circulation might lead to hydropic changes in the yolk sac. Miscarriages with trisomy 21 were shown to have normal first trimester ultrasound findings¹⁴, the only trisomy 21 case in our study had YSD within the normal ranges. Based on the findings of this study, sensitivity of the YSD measurement is very low and it cannot be used as a screening test. On the contrary a small YSD <5th percentile can be used as a reassuring sign for a pregnancy that would result in a live birth.

Previously abnormal yolk sac shape was suggested to have a prognostic role^{13,16}, we did not search the effect of yolk sac shape on the prognosis of pregnancy because of its subjective nature and we did not comment on it. We did not find any association between gestational sac size and yolk sac size.

After detection of the embryonic cardiac activity 4.5% of our pregnancies resulted with miscarriage, this rate is similar to that reported previously.¹⁴ Women older than 35 years of age were shown to have higher abortion rates, even after the detection of cardiac activity.² In our study there was no association between maternal age and miscarriage similar to the results of a previous report.

In conclusion an enlarged yolk sac may be predictive of a future miscarriage. They should be offered a new ultrasound within 2 weeks. Sharing the results of an abnormal ultrasonography with the patient may create unnecessary anxiety. We only advise to use the favorable results as a reassuring sign to decrease the number of ultrasonographies.

Yazışma adresi / Correspondance

Yrd. Doç. Dr. Nilgün Güdücü

Yrd. Doç. Dr. Herman İşçi

Prof. Dr. Alin Başgül Yiğiter

Prof. Dr. İlkkan Dünder

İletişim: Kısıklı cad. No:106 Altunizade, 34692, İstanbul,

E-mail: nilgun.kutay@gmail.com.

Tel: +90 0533 6404010

Fax:+90 02163250104

Yolk Kesesinin Boyutu Düşüğü Öngörebilir Yolk Sac Size Can Predict Miscarriage

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