

Visualization of the Ovaries in Early Pregnancy by Transvaginal Sonography

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Abstract

Objective: To determine the frequency of visualization of the ovaries by transvaginal sonography (TVS) in a group of women in early pregnancy and to determine the onset of a decrease in sonographic visualization of the ovaries during this time.

Methods: The study population included all patients with an intrauterine pregnancy confirmed by the presence of a yolk sac, embryo, or fetus. The biometric data included crown–rump length and/or gestational sac mean diameter corresponding to ≤ 14 weeks' gestational age (GA).

Results: The study population included 11 095 women, of whom 1972 (17.8%) had a GA ≤ 6 weeks, 4665 (42.0%) 6.1 to 8 weeks, 2782 (25.1%) 8.1 to 10 weeks, 1208 (10.1%) 10.1 to 12 weeks, and 468 (4.2%) 12.1 to 14 weeks. At least one ovary was identified in 11 043 women (99.5%), and both ovaries were identified in 10 620 women (95.7%). Only the right ovary was identified in 274 women (2.5%), and only the left ovary was identified in 149 women (1.3%). In 52 women (0.5%), neither ovary was identified. Both ovaries were identified in 1929 pregnancies of ≤ 6 weeks' GA (97.8%), in 4528 between 6.1 and 8 weeks' GA (97.1%), in 2664 between 8.1 and 10 weeks, GA (95.8%), in 1114 between 10.1 and 12 weeks' GA (92.2%), and in 385 between 12.1 and 14 weeks' GA (82.3%).

Conclusion: Transvaginal sonography achieved an overall visualization of one or both ovaries in 99.5% women with pregnancies of ≤ 14 weeks, GA. Both ovaries were visualized in 95.7% of women. A significant decline in ovarian visualization occurred after 10 weeks' GA. The results provide reference data on the likelihood of ovarian visualization in early pregnancy.

Key Words: Ovaries, transvaginal ultrasound, early pregnancy

Competing Interests: None declared.

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Résumé

Objectif : Déterminer la fréquence de la visualisation des ovaires par échographie transvaginale (ÉTV) au sein d'un groupe de femmes en étant aux débuts de la grossesse, ainsi que déterminer le début du déclin de la visualisation échographique des ovaires au cours de cette période.

Méthodes : La population à l'étude comprenait toutes les patientes présentant une grossesse intra-utérine confirmée par la présence d'une vésicule ombilicale, d'un embryon ou d'un fœtus. Parmi les données biométriques, on trouvait la distance vertex-coccyx et/ou le diamètre moyen du sac gestationnel correspondant à un âge gestationnel (AG) ≤ 14 semaines.

Résultats : La population à l'étude comprenait 11 095 femmes, dont 1 972 (17,8 %) présentaient un AG ≤ 6 semaines; 4 665 (42,0 %), entre 6,1 et 8 semaines; 2 782 (25,1 %), entre 8,1 et 10 semaines; 1 208 (10,1 %), entre 10,1 et 12 semaines; et 468 (4,2 %), entre 12,1 et 14 semaines. Au moins un ovaire a été identifié chez 11 043 femmes (99,5 %), tandis que les deux ovaires ont été identifiés chez 10 620 femmes (95,7 %). Seul l'ovaire droit a été identifié chez 274 femmes (2,5 %) et seul l'ovaire gauche a été identifié chez 149 femmes (1,3 %). Chez 52 femmes (0,5 %), aucun des ovaires n'a été identifié. Les deux ovaires ont été identifiés chez 1 929 grossesses de ≤ 6 semaines d'AG (97,8 %); chez 4 528, entre 6,1 et 8 semaines d'AG (97,1 %); chez 2 664, entre 8,1 et 10 semaines d'AG (95,8 %); chez 1 114, entre 10,1 et 12 semaines d'AG (92,2 %); et chez 385, entre 12,1 et 14 semaines d'AG (82,3 %).

Conclusion : L'échographie transvaginale a permis, globalement, la visualisation d'un ou de deux ovaires chez 99,5 % des femmes présentant une grossesse de ≤ 14 semaines d'AG. Les deux ovaires ont été visualisés chez 95,7 % des femmes. Une baisse significative de la visualisation des ovaires s'est manifestée après 10 semaines d'AG. Les résultats offrent des données de référence quant à la probabilité de pouvoir visualiser les ovaires aux débuts de la grossesse.

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INTRODUCTION

It is widely acknowledged that ovarian visualization by ultrasound becomes increasingly difficult as pregnancy progresses, with many challenges presented by the progressive displacement of the ovaries by the gravid uterus. Previous studies have documented the decrease in ovarian visualization by either transvaginal sonography (TVS) or transabdominal ultrasound between the first trimester and the second or third trimester.¹⁻³

This study was undertaken to clarify the timing of decreased ovarian visualization by TVS in early pregnancy and to provide reference data for visualization of normal ovaries in the early weeks of pregnancy.

MATERIALS AND METHODS

We reviewed the records of women with an asymptomatic early pregnancy who presented for a dating ultrasound between January 2000 and December 2003 at the Women's Health Centre (Toronto, Ontario). The study population consisted of all patients with an intrauterine pregnancy confirmed by the presence of a yolk sac, embryo, or fetus. The biometric data recorded included crown-rump length and/or gestational sac mean diameter corresponding to ≤ 14 weeks' gestational age (GA). If the subject had more than one evaluation within the same pregnancy, only the measurements from the first were included. Studies were performed by experienced certified sonographers using a 4–8 MHz transvaginal transducer on a Philips ATL 1500. All cases were supervised by a radiologist. The study was approved by the Research Ethics Board of Sunnybrook and Women's College Health Sciences Centre.

Standard transvaginal technique was used, with an empty maternal urinary bladder. Once the transvaginal transducer was placed into the vagina and advanced to the posterior fornix, an attempt to visualize the ovaries was initially made along both sides of the uterus, especially at the level of the cornua. If this method failed, the area along the internal iliac vessels was insonnated. If this was unsuccessful, gentle manual pressure was applied to the lower abdominal wall in order to bring the ovary to the field of view of the transducer or to displace overlying bowel loops. The presence of an ovary was confirmed in two orthogonal views and recorded on videotape.

The study population was divided into five chronologic groups according to their gestational ages: ≤ 6 weeks (group 1); 6.1 to 8 weeks (group 2); 8.1 to 10 weeks (group 3); 10.1 to 12 weeks (group 4); and 12.1 to 14 weeks (group 5). The gestational age groups were compared for the visualization of ovaries using a chi-square statistic.

RESULTS

The study population consisted of 11 095 pregnant women. There were 1972 (17.8%) women in group 1, 4665 (42.0%) in group 2, 2782 (25.1%) in group 3, 1208 (10.1%) in group 4, and 468 (4.2%) in group 5. The prevalence of documented twins was 0.63% and of triplets was 0.01%.

The rates of visualization of both ovaries, only one ovary, or neither ovary are shown in Table 1. These rates of visualization in the five groups defined by gestational age are shown in Table 2.

DISCUSSION

The purpose of our study was to determine the frequency of visualization of one or both ovaries in early pregnancy by TVS and to evaluate the difference in the ability of TVS to visualize the ovary during this time period.

The study population consisted of asymptomatic women who presented for an early dating ultrasound in an outpatient clinic setting. Acutely symptomatic patients were referred to the affiliated urgent care centre and excluded from the evaluations. Only the first examination in each pregnancy was included in the study, resulting in cross-sectional data. No further demographic information was obtained on this population.

Higher order pregnancies were included. The prevalence of documented twins and triplets was similar to earlier Canadian birth data (from 1974), suggesting that ovarian stimulation (more frequently used in 2000–2003 than 1974) was unlikely to be a significant factor in the frequency of ovarian visualization.⁴

The use of TVS achieved an overall visualization of one or both ovaries in 99.5% of pregnant women with sonographically confirmed pregnancies of ≤ 14 weeks' gestational age. Both ovaries could be visualized in 95.7% of the study population. These results reflect the experience of an ultrasound facility with a large daily volume of patients and are comparable with several studies quoting approximately 95% to 100% visualization of the ovaries during this time period.^{1,2,5,6}

Hill et al. were the first to report ovarian visualization rates throughout pregnancy, using cross-sectional data from 5617 pregnant women between 5 and 39.9 weeks of gestation.¹ They divided their study population into three groups according to trimester, with 829 patients in the first trimester and 3195 in the second trimester. They identified one or both ovaries in 99.8% of women in the first trimester, but in only 75.6% of women during the second trimester. Shalev et al. (2000) prospectively examined 329 women during the course of a normal pregnancy and could identify both ovaries using TVS in 95% of women in the first trimester;

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