

# Pitfalls in First-Trimester Bleeding

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## KEYWORDS

- First trimester • Pregnancy • Emergency department
- Vaginal bleeding

Vaginal bleeding during pregnancy is a significant event in a woman's life. It warrants a thoughtful emergency department (ED) evaluation with careful attention to avoid pitfalls that may pose unexpected consequences. There are many reasons for vaginal bleeding during pregnancy. The differential of vaginal bleeding in gravid women varies immensely depending primarily on the stage of the pregnancy. Some diagnoses are serious and pose significant health risks; others are less of an issue from a medical perspective. Regardless of the cause, any gravid patient with vaginal bleeding can be emotionally upset.

The focus of this article is first-trimester bleeding. Vaginal bleeding during the first 3 months of pregnancy is a common event. It is important that emergency physicians recognize patients with vaginal bleeding who may have an adverse outcome if misdiagnosed or not treated appropriately in the ED. Causes of first-trimester vaginal bleeding include implantation bleeding, spontaneous abortions (SABs), ectopic pregnancy, and lesions involving the female reproductive system and perineal area infections.

Patients may not always recognize that they are pregnant, so it is critical to order a pregnancy test on any woman of childbearing age presenting to an ED with vaginal bleeding, spotting, or lower abdominal pain. Also, childbearing age in the modern area of fertility treatment has changed dramatically and should be taken to mean all women who still menstruate. The various pregnancy tests have limitations. There are two general classes of pregnancy tests: quantitative and qualitative. Serum  $\beta$ -hCG tests are generally quantitative and provide clinicians with a numeric  $\beta$ -hCG value that can be followed over time. Early in a normal pregnancy, this value is expected to double approximately every 2 to 3 days. Qualitative tests, alternatively, are generally used for screening purposes. Urine pregnancy tests are qualitative tests and give a provider a "yes" or "no" answer to the question, "Is this patient pregnant?" The

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newer generation of urine pregnancy tests detect low levels of  $\beta$ -hCG, approximately in the range of 25 to 50 IU/L, so are excellent pregnancy screening tools.<sup>1</sup> Some authors have suggested that dilute urine with a specific gravity of less than 1.015 may produce a false-negative result; however, urine immunoassays currently used are extremely sensitive and produce a positive result even when testing dilute urine.<sup>2</sup> Instructions should be followed explicitly, however, with regard to length of time to read a test result after the urine is added in order to avoid a false-negative result. Another potential pitfall with respect to pregnancy tests is a false-negative result as a result of the high-dose hook effect. When patients have a high  $\beta$ -hCG, as with patients with a hydatidiform mole (or molar pregnancy), the test can be overwhelmed by the high concentration of  $\beta$ -hCG and result in false-negative urine and serum  $\beta$ -hCG test results. If a diagnosis of molar pregnancy is entertained for a patient, dilution of the serum or urine sample is key because high levels of the substrate can overwhelm the assays.<sup>3</sup> A final comment about pitfalls with respect to serum pregnancy tests and ectopic pregnancies is that quantitative  $\beta$ -hCG levels are not helpful alone in differentiating a failing intrauterine pregnancy (IUP) from an ectopic pregnancy.<sup>4</sup>

One common cause of first-trimester vaginal bleeding is implantation bleeding. It reportedly occurs in up to one-third of pregnant women early in their pregnancy. Implantation bleeding occurs approximately 4 weeks after a woman's last menstrual period. The bleeding is a result of a fertilized egg implanting and invading the wall of the endometrial cavity. Implantation bleeding is generally not copious and often described as simply a small amount of pinkish or brownish blood on a woman's undergarments although frank blood can be expelled from the vagina. It is not heavy, and the duration of this type of vaginal bleeding is less than expected from a woman's normal menses. Cramping and backaches do not usually accompany implantation bleeding. Implantation bleeding is a benign process. The pitfall lies in attributing vaginal bleeding in the first trimester to the implantation process when it is actually something more serious.

Ectopic pregnancy, in contrast to implantation bleeding, is a life- and fertility-threatening condition. This is a diagnosis clinicians should not miss. Unfortunately, missed and delayed diagnoses of ectopic pregnancy are not infrequent. In one study published in 1980, it was reported that ectopic pregnancies were missed 50% of the time on their first medical consultation.<sup>5</sup> With the advent of ED-focused bedside ultrasound and increasingly sensitive urine pregnancy tests, this statistic hopefully has improved but there are no recent studies evaluating this. Unfortunately, ectopic pregnancies are increasing. In the United States, the incidence of ectopic pregnancy increased from 4.5 per 1000 reported pregnancies in 1970 to 19.7 per 1000 pregnancies in 1992, equating to 2% of reported pregnancies and 9% of pregnancy-related deaths.<sup>6</sup> Heterotopic pregnancies are also on the rise. A heterotopic pregnancy is the coexistence of an IUP and an ectopic pregnancy. The occurrence is rare (1 in 2600 pregnancies) but the incidence increases dramatically with fertility treatments.<sup>7</sup> With the advent of bedside ultrasound and  $\beta$ -hCG tests, the incidence of ruptured ectopic pregnancies and fatality rates have declined from 35.5 deaths per 10,000 ectopic pregnancies in 1970 to 3.8 deaths per 10,000 in 1989.<sup>8</sup>

Implantation of a fertilized egg normally occurs in the superior and posterior walls of the uterine cavity. Simply defined, an ectopic pregnancy is any pregnancy that occurs outside the uterus generally in the female reproductive tract and less commonly in the abdominal cavity. Symptoms of an ectopic pregnancy develop as the pregnancy grows and distorts surrounding tissue or ruptures causing hypotension or peritoneal irritation. Patients at greatest risk for ectopic pregnancy are women who have anatomic abnormalities, such as scarring or functional abnormalities with their

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