

Trauma Management of the Pregnant Patient



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KEYWORDS

• Trauma • Pregnant patient • Management • Fetus

KEY POINTS

- Trauma is a leading cause of nonobstetric maternal and fetal mortality.
- Pregnant patients should be treated systematically like all other trauma patients, but often standard trauma principles are deviated from when caring for a pregnant trauma patient.
- Education of at-risk pregnant patients can make a large impact on decreasing traumatic morbidity and mortality in this population and even preventing injuries.

INTRODUCTION

In 1 way or another pregnancy affects us all, whether that the development and birth of your own child, a close friend's, or a family member's. It would be wonderful if all of these experiences were guaranteed to be uncomplicated, but the pregnant woman is not exempt from anything in life, including trauma. Trauma continues to be a leading cause of maternal and fetal mortality worldwide.

When entering the trauma bay with a pregnant patient, it is fair to say that the stakes are immediately raised. Identifying the pregnant trauma patient will not always be easy, so it is imperative to test for pregnancy in all women of childbearing age. Pregnancy is not always detectable by physical examination, for example, in the early trimesters or in the setting of morbid obesity.

Once the pregnant patient is identified, not only does the provider have to consider 2 patients, but also understand the multiple anatomic and physiologic changes that occur during pregnancy and how to appropriately treat this subgroup of the population. The early establishment of a multidisciplinary team of individuals is imperative. These teams may often include an emergency medicine physician, trauma surgeon, obstetrician, critical care intensivist, and neonatologist. Although the treatment of

Nothing to disclose.

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the mother precedes that of the fetus, a rule to keep in mind in these difficult situations is that what is good for the mother is almost always good for the fetus.

EPIDEMIOLOGY

Approximately 7% of pregnancies in the United States are affected by trauma and this is reported to be the leading cause of nonobstetric maternal and fetal mortality.^{1,2} Falls, domestic violence, and motor vehicle crashes (MVCs) are the most common mechanisms of injury encountered in pregnant patients, whereas the most common causes of maternal mortality are penetrating trauma and MVCs.³

In a retrospective analysis of 321 pregnant trauma patients, blunt trauma was noted to be 10 times more common than penetrating trauma. However, maternal mortality was noted to be higher in the penetrating trauma group (7%) than the blunt trauma group (2%). The fetal mortality difference in penetrating and blunt trauma was even more pronounced at 73% and 10%, respectively.⁴ Penetrating trauma should immediately raise concern for impending fetal demise.

According to US Centers for Disease Control and Prevention there are just over 4 million births reported yearly in the United States⁵; if 7% of them are affected by trauma, this totals just about 300,000 pregnant individuals affected by trauma in the United States alone per year. This is a significant number and being knowledgeable on the appropriate care for these patients is essential.

ANATOMY AND PHYSIOLOGY OF PREGNANCY

Anatomic Considerations

Throughout the pregnancy, as the fetus grows the uterus gradually ascends through the abdominal cavity, being limited to the pelvis for only the first 12 weeks. It reaches the umbilicus around week 20 and peaks at the costal margin between weeks 34 and 38. This leads to the gradual displacement of intraabdominal organs from their usual landmarks. During the first trimester, the fetus remains protected by the bony pelvis and a thick-walled uterus; however, this changes in the second and third trimester. As the fetus grows, it becomes the most anterior structure in the abdomen and is only protected by the soft tissue of the abdominal wall and the thinning uterine wall, leaving it as well as the uterus and placenta more vulnerable to injury. The enlarging uterus bestows protection to the maternal organs by pushing the bowel cephalad and encasing it by the lower rib cage and lying anterior to the retroperitoneal organs.

The uterus and placenta provide a new threat similar to solid organ injury in that they can lead to a significant amount of rapid blood loss causing hemorrhagic shock from a source that is difficult to identify visually. Other anatomic changes to consider include the slight widening of the pubic symphysis and an altered center of balance, leading to an increased predisposition to falls. Women in their third trimester have been shown to have a decrease in postural stability.⁶ This may be one of the reasons women are more susceptible to trauma in the later stages of pregnancy.

Cardiovascular Physiology

In the pregnant patient, there is a greater circulating blood volume for 2 major reasons. First, there is systemic vasodilation and decreased peripheral vascular resistance, which can be seen as early as 5 weeks into pregnancy and is likely augmented by increases in progesterone and estrogen. This is accompanied by the growth and maturation of the placenta, a large vascular organ, which leads to a larger overall volume of distribution for circulating blood.⁷ The vasodilation and increased volume of

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