

Spontaneous hemoperitoneum in pregnancy

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ABSTRACT

Spontaneous hemoperitoneum in pregnancy (SHP) is an uncommon, but very critical complication when present in pregnancy, leading to important morbidity and mortality for both mother and fetus. The etiology includes a large spectrum of causes, not taking into consideration trauma or other pathologies not pregnancy related. One of the most frequent triggers is the rupture of the varicose veins around the uterus that can occur either spontaneously or during labor, that can be associated with the unfortunate event of delivery of a stillborn baby. Endometriosis has been suspected to be also implicated in the apparition of spontaneous hemoperitoneum in pregnant women due to the fragility of the tissues associated with endometriosis chronic inflammation (ruptured endometrioma, intraabdominal adhesions, decidualization at the site of endometriotic implants). Even the operative vaginal delivery can conduct to this complication, but the cases described in the literature were also associated with lesion of endometriosis at the bleeding site. Moreover, assisted reproductive procedures (IVF-ET) is incriminated as one of the possible etiologies. The improvements in the resuscitation, operative and anesthetic management of these cases have lowered the maternal mortality, but perinatal mortality still has a high value (31%). Symptoms as acute or subacute abdominal pain, that can be associated or not with hypovolemic shock and signs of fetal affliction, identified as heart decelerations, should raise a question mark regarding the possibility of a hemoperitoneum. Electronic research for subject related reviews and articles has been made, using PubMed, Medline, Cochrane Data Base and also the current international guidelines regarding the management of hemoperitoneum in pregnancy, recommended by Obstetrics and Gynecology Societies in United States and United Kingdom.

Adequate case management as hematologic analysis, abdominal ultrasound, CT scan or MRI should reveal free intrabdominal fluid and estimate the blood loss, which can then be confirmed by paracentesis or by direct urgent laparotomy or laparoscopy. The aim of the current review is to raise awareness of this rare, but potentially fatal, complication in pregnancy and its most appropriate management, according to the current information presented in the medical literature.

Keywords: spontaneous, hemoperitoneum, pregnancy, endometriosis

INTRODUCTION

Spontaneous hemoperitoneum is an exceptional event that can occur during pregnancy. The clinical appearance associates abdominopelvic pain with sudden onset, a state of hypovolemic shock of the mother, the severity depending on the quantity of the hemoperitoneum. The state of the fetus can vary from normal to serious distress going to fetal demise in utero [1-4]. This review excludes hemoperitoneum due to recent trauma. When a pregnant

woman experiences acute abdominal pain and trauma is excluded, a quick work-up for pregnancy related complications that are highly probable to affect the baby and the mother must be done [2]. The algorithm should firstly exclude pathologies related to pregnancy that can provoke pain, as ruptured ectopic pregnancy, uterine rupture, fibroid degeneration, rupture or torsion of an ovarian cyst, severe preeclampsia, HELLP syndrome, labor, intra-amniotic infection, or acute fatty liver [5-8]. If

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the patient presents with abdominal pain and hypotension, without vaginal bleeding or history of recent trauma, hemoperitoneum should be firstly excluded. There is a vast number of causes for hemoperitoneum, the most frequently described being a rupture of a visceral vessel (possible artery aneurysm, uterine veins) or of an organ (spleen or liver). Associated nausea and vomiting, should moreover raise suspicion, as the peritoneum irritation could conduct to these. Peritoneal signs, as abdominal or pelvic guarding and rebounding tenderness, are unusual in a pregnant woman and need further investigations in order to exclude a life-threatening complication [5,6]. The physiologic adaptation related to pregnancy should not impact the rapidity of the diagnosis and management, even though it can increase the difficulty of the differential diagnosis.

METHODS

Electronic research for subject related reviews and articles has been made, using PubMed, Medline, Cochrane Database, and the current international guidelines regarding the management of hemoperitoneum in pregnancy, recommended by Obstetrics and Gynecology Societies in United States and United Kingdom.

The most relevant causes met in clinical practice of hemoperitoneum in pregnancy were studied, with emphasis on the SHP due to the rupture of uterine varicosities and its association with endometriosis and IVF-ET. The best management of this critical cases and the required follow-up were discussed in order to improve the maternal and fetal outcome and to reduce the subsequent morbidity and mortality for both of them. All the documentation that was used is mentioned in the reference section below.

ETIOLOGY

There are many pathologies related or not to pregnancy that can conduct to hemoperitoneum as ruptured ectopic pregnancy, uterine rupture, rupture of an ovarian cyst, rupture of a visceral vessel (possible artery aneurysm, uterine veins) or of an organ (spleen or liver). Trauma induced hemorrhage is excluded from this review and spontaneous hemoperitoneum due to the rupture of uterine varicosities and its association with endometriosis and IVF-ET will also be approached, along with the most frequently clinical situations encountered in daily practice (ectopic pregnancy, uterine vessels rupture, uterine rupture, bleeding ovarian cyst and rupture of a visceral vessel or organ). Pregnancy related causes are the first that should be assessed

since they have a great potential to affect both mother and fetus [8,9].

Ectopic pregnancy

Ectopic pregnancy is usually located in the fallopian tubes, but in rare cases other sites of implantation can occur (ovaries, cervix, abdominal cavity). When the pregnancy develops, it can cause severe bleeding due to its rupture. Abdominal pain with acute or subacute onset is the primary symptom that leads the patient to the emergency room and can be accompanied sometimes by vaginal bleeding. Other clinical manifestations may include hypotension and tachycardia caused by great blood loss. Ultrasound exam reveals free abdominal fluid, which in correlation with the clinical examination, blood analysis and serum beta HCG levels, conduct to the diagnosis and the necessity of urgent laparoscopy for diagnosis and treatment [10].

Rupture of uterine vessels

The bleeding origins more frequently from the posterior uterine wall, the vessels situated in the broad ligaments or in the uterosacral ligaments and is associated in more than 50% of the cases with lesions of endometriosis. Furthermore, the pressure in the venous vessels increases in pregnancy as a consequence of the enlarged uterus, and there is a risk that physical activities and efforts as sport, coughing, the effort of defecation, coitus or labor, that subsequently enhance the venous pressure, favors the development of SHP [1,3]. There are cases of SHP not related to any efforts, as the occurrence of a rupture vessel situated in the broad ligament during sleep, manifested as an acute pain located in one of the iliac fossae with rapid evolution to diffuse abdominal pain, episodes of vomit, tachycardia, hypotension, and fetal damage [2]. One must pay attention not to mistake the onset symptoms with a nephretic colic as in a case report, with dramatic fetal consequences [1,7].

Uterine rupture

The uterine rupture in pregnancy is considered a disaster in obstetrics, that can lead to both maternal and fetal demise. In developed countries, due to adequate labor management and continuous monitoring, it's an exceptional situation mostly associated with a history of an anterior cesarean section or myomectomy and vaginal birth for the second pregnancy. In low income countries, the rupture of the gravid uterus still represents a major health issue, as a result of lack of patient care, poorly conducted labor, multiparity, dystocia, wrong manipulations due to lack of experience of the medical personal and especially the lack of accessibility to emergency

care. Symptoms like abnormalities of the fetal monitoring or the fetal death in utero, tenderness of the uterus, intense abdominopelvic pain with peritoneal signs, that can be associated with vaginal blood loss, hemorrhagic shock, should immediately raise suspicion of this diagnosis [11,12].

Bleeding ovarian cyst

Bleeding ovarian cyst that leads to hemoperitoneum is a rare situation which can occur even in the first trimester of pregnancy due to the rupture of the corpus luteus cyst. The symptoms are similar as the ones mentioned above, but the management should include hemostasis with careful preservation of the corpus luteus taking in consideration its vital function in maintaining the pregnancy and ensuring the progesterone level required until the luteal-placental shift that occurs after the 7th week of pregnancy. Good management includes laparoscopy, evacuation of the hemoperitoneum and cautious hemostasis. Prophylactic progesterone substitution should be taken into consideration if there is a doubt about the tissue viability post hemostasis [13,14].

Visceral artery aneurysm rupture

The most commonly described cases of aneurysms met in clinical practice affect the splenic, the renal, the common hepatic and the pancreatic-duodenal arteries. Pregnancy is known to be a risk factor for spontaneous rupture of visceral aneurysms. Even though the aneurysm rupture is not frequent, which increases moreover the difficulty of diagnosis, its occurrence leads to catastrophic outcome for the mother and fetus. There are several cases described in the literature of splenic and renal aneurysm rupture, that conducted to acute abdominal pain and rapidly installed hemodynamic instability, and sometimes lifesaving management could include the ipsilateral nephrectomy. Endovascular treatment such as stent or embolization has shown better result in comparison with surgical management (resection, ligature, interposition of graft) [15,16,17].

Hepatic and spleen rupture

Hypertensive disorders in pregnancy can induce intraabdominal hemorrhage with hepatic origin. The management of hemoperitoneum due to hepatic affliction can vary from conservative hemostasis or endovascular embolization to partial hepatectomy

and even the necessity of liver transplant could be taken into consideration. Another organ that can suffer spontaneous rupture during pregnancy due to high pressure posed by the enlarged uterus is the spleen. Acute pain, with the onset in the left upper quadrant of the abdomen and the presence of signs of peritoneal irritation should raise suspicion. The treatment implies rapid intervention, evacuation of the blood and splenectomy. Both hepatic and spleen ruptures can conduct to fetal demise in utero and pose serious risks to the mother's life [18,19,20].

MANAGEMENT

The occurrence of SHP even though is a rare event, is life-threatening condition for both mother and fetus. The possible causes are numerous as mentioned above. A pregnant woman that presents in the emergency room with rapid onset of abdominopelvic pain, anomalies of fetal heart rate, peritoneal signs or hypovolemic shock should undergo immediately careful examination that includes physical examination, including the fetal status, laboratory tests, which show unusual low values of hemoglobin, and imaging investigations (ultrasound, MRI, CT) that reveals free intraperitoneal fluid. Any suspicion regarding the diagnosis of hemoperitoneum implies performing urgent laparoscopy in order to find the bleeding source and to be able to perform attentive hemostasis [8,21]. If anormal fetal heart rate is detected and the ultrasound evaluation of the fetus shows signs of distress, quick delivery of the baby by cesarean section is necessary. The possibility of recurrence in the same pregnancy or in the next ones has been described [21,22].

CONCLUSIONS

Attentive consideration should be paid to all pregnant woman that present with acute onset of abdominal pain, signs of rebound tenderness and peritoneal guarding, and even hypovolemic shock and the diagnosis of hemoperitoneum and evaluation of the fetal status should not be delayed. Rapid case management consisting in immediate surgical intervention can save the mother's and the future baby's life, even though the perinatal mortality rate still remains high. The physiologic adaptation related to pregnancy should not impact the rapidity of the diagnosis and management, even though it can increase the difficulty of the differential diagnosis.

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