Analysts for the Pennsylvania Patient Safety Authority queried the Authority’s reporting system database for maternal complications of pregnancy and childbirth. Search criteria included either (1) the event types for maternal complications or (2) events in obstetric, labor and delivery, and operating room venues with mention of “mother” or “maternal” in the narratives. The analysts limited the search to Serious Events (reporting patient harm) among female patients 15 years old and older from the beginning of event reporting (officially June 28, 2004) through August 31, 2009. Neonatal complications were excluded.

The search resulted in the identification of 256 reports of maternal complications causing harm to the mother. The ages of the mothers ranged from 16 to 47. For the 203 reports in which the method of delivery was mentioned, 99 deliveries were vaginal and 104 were ultimately by cesarean section.

Table 1 lists the reports by event type. Some events have been reclassified by the analysts for consistency in reporting aggregate figures.

**Deaths**

Twenty mothers died, including three with intrauterine fetal demise. Four of the deaths were due to amniotic fluid emboli. Others were associated with Group A streptococcus infection, postpartum bleeding, pulmonary embolus, uterine rupture, cerebrovascular thrombosis, and seizure; two of the patients had hysterectomies for postpartum bleeding (one died of a pulmonary embolus). Half of all the deaths were attributed to cardiac and/or pulmonary failure not otherwise specified.

**Unplanned Transfers to Intensive Care Units (or Other Higher Levels of Care)**

Five patients had cardiac and/or respiratory arrests, not due to blood loss or emboli, and survived; one was thought secondary to an adverse drug reaction to Pitocin®. Another seven patients had other cardiac and/or pulmonary complications not due to blood loss or emboli. Two patients had HELLP syndrome, a complication of pre-eclampsia characterized by hemolytic anemia, elevated liver enzymes, and low platelet counts, without further complications. One patient was transferred to the intensive care unit postoperatively, without any reasons given.

**Uterine Ruptures**

Fifteen patients ruptured their uteri during labor or delivery and survived. Six patients were attempting vaginal births after cesarean sections (VBAC); two (33%) were reported to have needed hysterectomies. Four of the other nine patients surviving uterine ruptures during labor and delivery were also reported to have needed hysterectomies (40% including the death). One other patient ruptured in midpregnancy because of a uterine abnormality. One more ruptured during a dilation and curettage procedure for a miscarriage.

**Unanticipated Blood Transfusions, Plus Other Complications Causing Significant Bleeding**

Postpartum bleeding was, by far, the most commonly reported maternal complication (46% of all the reports), with 118 patients having significant bleeding requiring treatment, for reasons other than uterine rupture, and surviving. The causes of bleeding included uterine atony, placental complications, lacerations, hematomas, postoperative bleeding, and coagulopathies. One report involved bleeding from...
perforation of the uterine wall during insertion of a Foley catheter. Hysterectomies were reported to be needed to control the bleeding in 36 of these survivors, plus the 2 patients who died (discussed above), and 1 survivor whose most significant problem was a subdural hematoma secondary to her diffuse intravascular coagulation (DIC) (discussed below).

Pulmonary Emboli
Two patients survived pulmonary emboli. One had a vaginal delivery and the other had a cesarean section.

Seizures, Plus Other Central Nervous System Complications
Six patients were reported to have seizures and survived. None of the seizures were a pre-existing comorbidity. Two other patients were added to this group by the analysts. Both had subdural hematomas; one was secondary to disseminated intravascular coagulation severe enough to necessitate a hysterectomy.

Primary Infections
One patient developed septic shock. Three patients had chorioamnionitis. Four patients developed necrotizing fasciitis of their wounds; three developed an intra-abdominal abscess; and five patients developed wound infections after cesarean sections. One other patient developed an infection of her episiotomy.

Other Complications
- Twenty-two patients had lacerations of the birth canal that did not present primarily as bleeding problems. All were related to vaginal deliveries. The lacerations were predominantly third- and fourth-degree perineal lacerations, one of which required a diverting colostomy. Other sites described were the vagina, the peri-urethral area, and the cervix.
- Six patients had neuropathies of their lower extremities.
- Five patients had lacerations of adjacent organs during cesarean sections that were reported as unanticipated complications; three were of the bowel and two were of the bladder. Another two bladder lacerations were reported as complications of cesarean sections done for the uterine ruptures mentioned above. Another bladder laceration, with concomitant ureteral obstruction, was reported as a complication of a cesarean section done for one of the patients with bleeding discussed above.
- Five patients had wound dehiscences after cesarean sections.
- Four patients had retained placentas, apparently uncomplicated by bleeding or infection.
- Three patients had retained objects. Two patients had vaginal sponges left after vaginal deliveries and repairs of vaginal lacerations. One patient had a needle fragment that needed finding at the end of a cesarean section.
- Two patients had skeletal injuries. One had a fractured rib and the other had a symptomatic pubic separation.
- Two patients had spinal headaches. Three ascending epidurals were also reported as anesthesia events.
- Two patients were delivered by the labor and delivery nurse; their primary providers were not present.
- Other complications included inadequate postpartum analgesia, inversion of the uterus, an allergic reaction to latex in a patient with a known allergy, a spontaneous rupture of the liver in a patient with HELLP syndrome, and conversion to an unplanned cesarean section after the successful vaginal delivery of a first twin.

Hysterectomies
Forty-five patients were reported to have needed hysterectomies: 2 who died following postpartum bleeding as noted above, 6 who survived uterine ruptures, 36 who survived postpartum bleeding, and 1 survivor whose DIC was complicated by a subdural hematoma. One of the patients, less than 30 years old, had a bilateral salpingo-oophorectomy as well. The mortality rate for the hysterectomies reported in response to maternal complications was 4%. Hysterectomies were done for 6 of the 16 patients (38%) who ruptured their uteri during labor and delivery (15 who survived and 1 who died). Hysterectomies were done for 39 of the 121 patients (32%) with bleeding complications (including the 2 who died, as noted above, and the 1 whose most significant problem was a subdural hematoma secondary to DIC). The mortality rate was 5% for the hysterectomies done as a potentially lifesaving procedure for postpartum hemorrhage.
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