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S.B. is a 29-year-old female who is gravida (number of pregnancies) 7 para (number of pregnancies past 20 weeks gestation) 7. The patient is allergic to epinephrine with no history of any diseases or disorders and no significant family history. She has no history of substance abuse of any kind and no education beyond a high school diploma. She is married, catholic and she is a stay at home mother that takes care of the children and does the shopping and cooking for the family. This patient was chosen due to the availability of data on both mother and newborn.

OB History

Date of Birth	Sex	Weight	Gestation	Route of delivery	Anesthesia
07/04/96	Male	6lb. 4oz.	40 weeks	Vaginal	None
04/21/00	Female	5lb. 2oz.	40 weeks	Vaginal	None
11/19/02	Female	5lb. 11oz.	40 weeks	Vaginal	None
03/11/05	Male	6lb. 2oz.	40 weeks	Vaginal	None
02/06/07	Male	_	39 weeks	Vaginal Precipitous	None
10/20/08	Male	_	40 weeks	Vaginal	None

Gestation is considered the period of development in the uterus from conception to birth. A term newborn is considered anything between 38 and 42 weeks. The patient had all of her babies naturally with no anesthesia and precipitous means she had a fast labor with the male born on 02/06/07. The average birth weight range for a term baby is 5lbs 8oz. to 8lbs 13oz. with the average weight being 7lbs 8 oz. Most of the patient's babies were in the smaller birth weight range and one was even below normal for a term baby. Studies have been done about the effects

of low birth weight on the future health of newborn such as the following excerpt by Moore and Davies (2005) shows:

> "The theoretical explanation put forward by Barker and colleagues is that chronic disease 'originates in developmental plasticity, in response to under-nutrition during fetal life and infancy' (Barker2004). The unborn baby responds physiologically to under-nutrition in ways that are adaptive in the short term but, according to this theory, these adaptations have sequelae that are potentially disadvantageous in the long term."

Pregnancy

During the pregnancy the patient took ferrous sulfate, which is an iron supplement used to prevent iron deficiency anemia. This is especially important in pregnancy because pregnant woman have higher iron needs than the non-pregnant population. Some side effects of the supplement include nausea, dark stool, and constipation. The patient also took prenatal vitamins, which help in providing all the nutrients a pregnant woman needs. Possible side effects of prenatal vitamins include nausea and constipation (due to high iron content).

The patient's pre-pregnancy weight was 197 and her total weight gain during the pregnancy was 12lbs.. Pregnant woman should ideally gain between 25 to 35lbs during pregnancy. This fact illustrates that S.B. did not meet the recommended weight requirement to meet her body's and her developing fetus's needs, however, every pregnancy is different and her health care providers may or may not have been concerned. This could also possibly be associated with the lower birth weight of her offspring mentioned in her OB history. Scholl et al (1995) mentions that "The adequacy of gestational weight gain and its pattern are important

protective factors associated with birth weight and gestation duration". The following excerpt from Moore and Davies (2005) also explains the importance of gaining weight while pregnant:

> "Low weight gain in the second and third trimesters has been linked repeatedly with intrauterine growth restriction, with a number of studies finding the highest risk pertained to the second trimester. There is some evidence that a relatively brief period of low weight gain in either second or third trimester can have an impact on newborn size (Strauss and Dietz 1999). Recently, one of the few studies to have recruited women before conception showed an effect of first trimester weight gain (Brown et al. 2002)."

The Following table represents the patient's prenatal lab values drawn on 01/26/2009:

LAB	Patient's value	Normal Values
White Blood Cells	9,400/mm^3	5,000-15,000/mm^3
Red Blood Cells	4.02 million/mm^3	4.2-5.4 million/mm^3
Hemoglobin	12.4 g/dL	10-14 g/dL
Hematocrit	36%	32%-42%
Platelets	303,000/mm^3	150,000-400,000/mm^3

These labs are all within normal range for a pregnant woman. The routine prenatal tests that were performed include an Antibody screen (which is used to detect antibodies in the blood that would attack the baby), a Pap test (used to detect cancer causing cells in the cervix), an RPR (used to check for syphilis), a screen for Hepatitis B surface antigen (used to detect hepatitis B), a test for Chlamydia and a test for group B streptococcus (GBS). GBS is an infection that is innocuous in adults but could possibly be fatal to an infant. If a mother tests positive for GBS (38% of women

do), she will be administered IV penicillin upon admission to a labor and delivery unit if she is indeed in progressive labor. All the above test results came back negative or normal. The patient's blood type is O positive, and she is rubella immune.

On 02/03/09 the patient had an ultrasound and her EDD (estimated date of delivery) was 09/30/09. On 05/21/09 the patient thinks she had kidney stones and complains of lower back pain. The researchers were unable to find any interventions or tests done related to the complaint of kidney stones in the patient's chart. On 06/30/09 patient's 1-hour glucose tolerance screening was performed and her serum glucose level was 118, which is within normal limits. On 08/04/09 the patient had another ultrasound and the EDD was 10/01/09. On 08/7/09 she fell on her bottom in her kitchen and complained of decreased fetal movement. According to Hill and Lense (1996), in a minor trauma such as a fall patients with potentially viable fetuses (those over 20 weeks of gestation) should be taken to the labor unit immediately for fetal monitoring, laboratory tests and possible ultrasonographic evaluation. The patient went to the hospital and was monitored for four hours, before being sent home. Subjectively the researchers came to the conclusion that this incident had to have put a lot of stress on the patient. This is supported by the fact that "abdominal trauma during pregnancy evokes anxiety in patients, their families and health care providers, and can cause significant medical problems for both the patient and the fetus." (Hill and Lense 1996).

Labor

On 09/20/09 S.B. was admitted to the hospital complaining of worsening contractions (tightening of the uterine muscles that push the baby out of the uterus and through the birth canal) and leaking of fluid. The patient was given an IV of 1000mL lactose ringers with 20units of Pitocin. Pitocin is used to induce labor and to control bleeding after expulsion of the placenta.

Side effects of Pitocin include asphyxia, coma, seizures, intracranial hemorrhage, and painful contractions. The normal dose given to laboring women is between 5 and 20milliunits/min. S.B. was also given 1000mcg of Cytotec rectally. Cytotec is used to prepare the cervix for delivery. The side effects of this medication include abdominal pain, diarrhea, and headaches. The normal dose is usually 800mcg a day by mouth. She also received 600mg of ibuprofen orally which is used to treat pain and inflammation. Side effects include headache, GI bleed, constipation, and nausea. Normal dosing is 200-400mg every 4-6 hours for pain or 400-800mg 3-4 times a day for inflammation.

On 9/21/09 at 0110 patient's cervix was effaced 80 percent, dilated 5-6 cm and a station of -2. Effacement is the cervix softening, shortening and thinning in preparation for birth; dilation is the expanding of the cervix; and the station is used to mark the fetal decent into the pelvis in relation to the mother's ischial spines (the smallest part of the pelvis), and zero is when the baby reaches the ischial spines. A station above the smallest part of the pelvis is recorded as a negative number anything below is considered positive.

At 0115 the baby presented tachycardia with decelerations. Tachycardia is a rapid heart rate and decelerations are drops in the baby's heart rate. Decelerations can be harmful if they're late decelerations, which are decelerations that start in the middle or end of a contraction and have not recovered by the end of the contraction. At 0130 the patient's contractions were 1-3 minutes apart and 50-70 seconds long. At 0235 patient was dilated 10 cm. At 0244 she delivered a female at 38 weeks gestation and at 0247 she delivered the placenta. The length of the labor was 2hrs and 47min and blood loss was 300mL. This is considered a normal amount of blood loss for vaginal delivery.

Postpartum

At 0800 the patient's vital signs were as follows: blood pressure was 128/88, pulse was 64 beats per minute, temperature was 98.6F (37.0 C), and respirations were 16 per minute and unlabored. The patient's pain was 5/10 and she was medicated with 600mg ibuprofen orally. The patient's skin was warm, pink and intact. Her lung sounds were clear bilaterally (both sides) with no cough present and her heart sounds were clear. The patient's breasts were non-tender and soft. Her abdomen was soft and non-tender with bowel sounds active in all four quadrants. Her uterus was firm and midline with a fundal height of -2 fingerbreadths below umbilicus. The fundus is the top part of the uterus. It is important to measure fundal height in relation to the symphysis pubis and the umbilicus during pregnancy to ensure adequate fetal growth. It is also extremely important to assess fundal height and firmness postpartally to ensure uterine involution (the return of the uterus to its normal, pre-pregnant state) and to assess for postpartum hemorrhage.

The patient is voiding and denies any urinary pain. The patient's lochia (vaginal bleeding and/or discharge) is moderate rubra (red) and the perineum is intact. There is no edema or tenderness present in the lower extremities. The patient exhibits a negative Homan's sign which means no pain in the legs upon sharp dorsiflexion of the feet. This is an important test to detect blood clots. The patient is also bonding well with infant and adjusting well to her postpartum state.

The following table illustrates the patient's lab values postpartum:

LAB	Patient's postpartum value
White Blood Cells	12,150/mm^3

Red Blood Cells	3.45 million/mm^3
Hemoglobin	10.8g/dL
Hematocrit	31.3%
Platelets	224,000/mm^3

The patient was ordered ferrous sulfate 325mg if her hemoglobin levels were less than 10 g/dL, but due to the fact that her hemoglobin was at 10.8g/dL, the patient was not given the medication.

Newborn

The patient had a female baby that was born at 38/5 weeks gestation weighing 6lbs 6oz. APGAR scores were 7 at 1 minute post-birth and 9 at 5 minutes post-birth. The APGAR is a system used to evaluate an infant's physical condition at birth, and the maximum score is a 10. The baby's Ballard score was 38 with no risk factors present. The Ballard test is a system for estimating gestational age by rating physical and neuromuscular characteristics.

The patient is bottle-feeding the baby Similac. Head to heel the baby was 48.3cm long and the head circumference was 33.5cm. The baby was given gentamycin ophthalmic ointment in both eyes. This is required by law and is a preventive measure against bacteria that might have been passed to the baby during labor and delivery. The side effects of gentamycin include blurry vision, irritation, and burning. The normal dose is a thin strip in both eyes. The baby also received a vitamin K shot. Vitamin K is given to promote clotting because neonates don't have the gut flora to produce vitamin K. Side effects include rash, hemolytic anemia, gastric upset, and pain at injection site. The normal dose is 0.5-1mg within 1 hour of birth given intramuscularly. She was also given a Hepatitis B vaccine. The vaccine is one out of three doses

she will receive to prevent being infected with hepatitis B. Side effects include allergic reaction, rash, dizziness, and redness at injection site. The normal dose is 0.5ml within 12 hours of birth given intramuscularly.

The baby's blood type tested A positive and negative for antibodies. Her serum glucose level was 57 which is a normal level for neonates. The following table illustrates the baby's umbilical cord labs:

Gas	Artery	Vein	Normal values
pH	7.367	7.414	7.32-7.49
pCO2	41.4 mmHg	38.2 mmHg	35-45 mmHg
pO2	37.3 mmHg	38.3 mmHg	60-70 mmHg
HCO3	23.2 mEq/L	23.9 mEq/L	20-26 mEq/L
CO2	24.5 mEq/L	25.1 mEq/L	22-32 mEq/L
Base excess	-2	-0.4	+1 to -2
O2 saturation	69.2%	73.35	96-100%

The lab values are normal apart from the low pO2 and O2 saturation. However, these values are not critical.

At 0800 the vitals were as follows: heart rate was 140 beats per minute, respirations were 42 per minute, and the temperature was 98.2F (36.8C). Neonatal infant pain scale scored the infant with a pain level of 0. The newborn's respirations were unlabored and clear and her heart sounds were normal. The baby's skin is pink and warm and the posterior and anterior fontanels are both soft.

A positive Moro reflex is present, as well as a positive Babinski reflex. The Moro reflex is the baby's startle response. The baby should straighten the arms and hands with the fingers spread while flexing the knees and then the arms return to the chest. The Babinski reflex is the spreading of the infant's toes when the bottom of the foot is brushed from bottom to top.

The neonate's mouth was clear with rooting and sucking reflex present. The rooting reflex is the baby turning its head towards something that brushes its cheek. The sucking reflex is the baby's instinct to suck when something is put in its mouth, and is elicited by the nurse by inserting a gloved pinky finger into the baby's mouth. The umbilical cord is clamped and moist.

Maternal Nursing Diagnoses

The researchers' first nursing diagnosis for this patient pertains to the mothers weight gain during pregnancy. The diagnosis is Nutrition Imbalance: Less than body requirements related to increased caloric requirements secondary to pregnancy. Interventions include determining daily caloric requirements that are realistic and adequate. The mother should consult with a dietitian to determine these requirements. The rationale behind this is "counseling the pregnant woman to eat a variety of nutrients from each of the food groups places less emphasis on the amount of her weight gain and more on the quality of her intake" (Davidson et al, 2004, pp. 423). If nausea is partly to blame for lack of intake of food teach patient to avoid cooking odors if possible. The rationale is that "for some women just simply avoiding the odor of certain foods or other conditions that precipitate the problem may relieve nausea." (Davidson et al, 2004, pp. 372). Another intervention is to explain the importance of nutrition and negotiate with patient intake goals for each meal and snacks. The rationale behind this is that "because the patient must follow the plan, it should be developed in cooperation with her, be suitable for her financial level and background and be based on reasonable, achievable goals" (Davidson et al,

2004, pp. 439). Finally, weigh the patient daily and monitor laboratory results as needed. The rationale is that "weight gain should be monitored regularly and dietary recommendations should be individualized to help the pregnant woman meet her caloric needs" (Davidson et al, 2004, pp. 424).

The second nursing diagnosis is related to the patient's fall and the effects that it had on her emotional status. The researchers' diagnosis is fear related to effects of trauma on fetal well-being. Interventions should include the encouragement of expression of feelings. The rationale behind this is that "the nurse has a primary responsibility to assess the childbearing woman's emotional state" (Davidson et al, 2004, pp 528). A second intervention is to explore fears and emotional responses about well-being of the fetus. The rationale for this is "the woman and her family are able to understand the effects of the trauma on her and her unborn child" (Davidson et al, 2004, pp. 528). Teach relaxation techniques such as slow, rhythmic breathing as needed. The rationale behind this is that breathing helps to relax the mother and keeps her focusing her attention appropriately (Davidson et al, 2004, pp. 660). A last intervention is to provide an emotionally nonthreatening atmosphere, the rationale being that "the nurse gives the pregnant woman an opportunity to discuss her feelings and concerns" (Davidson et al, 2004, pp. 528).

A third maternal nursing diagnosis is impaired comfort related to the involution of the uterus. This diagnosis is supported by the fact that the patient reported abdominal pain at 5/10 at 0800. This pain is most likely caused by uterine involution. The patient's obstetric history of being a gravida 7 puts her at increased risk for painful uterine involution. In a study by Angela Murray and Anita Holdcroft (1989), it was determined that after delivery the incidence of lower abdominal pain was significantly higher in multiparous women than in primiparous women. Not only did this studying determine that multiparous women had a higher incidence of after pains,

but the frequency of the pain in multiparous women was twice as high as the pain in primiparous women. The pain was exacerbated by breastfeeding, and women with two or more children could almost always recall a similar pain that tended to increase in severity with each labor (Murray & Holdcroft, 1989). Hence, the mother in this case study is very likely to have intense after pains due to the fact that she is a para 7 and it takes her uterus much more effort to return to its pre-pregnant state than it would for a para 1 or para 2 mother.

An intervention for this diagnosis is to provide analgesics prn (as needed) as ordered by the physician. This provides for the patient's comfort and well-being. Placing a warm water bottle on the lower abdomen also helps to decrease the patient's discomfort (Davidson et al, 2008, pp.1047). Another intervention is to monitor for constant tenderness of the uterine area, which could be a sign of postpartum infection (Davidson et al, 2008, pp. 1053). If constant tenderness is present, the nurse should assess for signs of endometreitis, which include foul-smelling, bloody vaginal discharge, the aforementioned uterine tenderness, saw-tooth temperature spikes between 101 and 104 degrees Fahrenheit, tachycardia, and chills (Davidson et al, 2008, pp. 1166).

A final intervention for the diagnosis of impaired comfort related to the involution of the uterus is to explain to the patient why the discomfort is occurring. If the patient is taught to understand that the "after pains" she is feeling are due to the uterus contracting and returning to it's normal pre-pregnant state, she may feel less anxiety over the discomfort she is experiencing. (Carpenito, 2008).

Neonatal Nursing Diagnosis

It is a known fact that the immune system of the small child, specifically the neonate, is not as responsive in protecting against external pathogens as that of an adult. Human neonates

are highly susceptible to infections by bacteria, fungi, and viruses. As a result, infection remains the single most common killer in early life (Marodi, 2005). Hence, the main focus of the nursing care for S.B.'s newborn daughter would be promotion of a healthy immune system and protection against nosocomial infection. The combined factors of the neonate's smaller size, the mother's decision to bottle feed instead of breastfeed (which provides immediate and long-lasting immune-enhancing advantages to a newborn) and the aforementioned fact that neonates are highly susceptible to infection validate the researcher's nursing diagnosis of risk for infection related to vulnerability of infant.

In the article *Innate Cellular Immune Responses in Newborns*, Marodi discusses the fact that newborns are not able to mount an efficient phagocytic response to a large number of pathogens. This difference in immune response (from that of adult humans) is due to a "defect in neonatal macrophage activation that involves pathways downstream from ligand-binding events and includes signal transduction pathways." In layman's terms, this is referring to the fact that we know that the first year of life is a major time of development for the human brain. An infant's brain is continuously making neurons and building connections. Many of these neurons are responsible for the immune response that Marodi refers to, and without the "complete set" of neurons, the brain cannot send signals to the body to fight pathogens it may encounter.

A nursing intervention for this diagnosis is to maintain meticulous hand washing techniques. The nurse should always provide the most aseptic care environment possible to the infant. Visitors should also be instructed to wash their hands upon entering the room (Carpenito, 2008). A second intervention for the newborn at risk for infection is to simply monitor the infant's behavior. Sometimes the infant may just appear to not be "doing well" and is lethargic or irritable. The neonate may also be hypotonic, hypotensive, and may have skin color changes

(Davidson et al, 2008, pp. 1027.) Monitor white blood cell count daily, as an increase in white blood cells is a sign of infection (Davidson et al, 2008, pp. 1024). Another intervention is to provide adequate caloric intake for the neonate. Proper nutrition is necessary to fight off a possible infection, and if the neonate is illustrating signs of a decreased appetite (as is common in illness) alternative forms of nutrition may be necessary (Davidson et al, 2008, pp1026).

Conclusion

After reviewing this case study the researchers have determined that the reader will receive an avid look into the most common types of mild problems that can occur with pregnancy, childbirth, and postpartum recovery of the mother and newborn. While the patients do not show significant signs of distress or display unique or idiopathic symptoms, the nursing care they receive is still very important to the recovery process. Simple teaching techniques can be the difference between sending a mother and baby home healthy or having an extended hospital stay due to complications. The researchers feel that this case study is a highly effective example of how evidenced-based care can provide for wonderful patient outcomes, and hope to have shed light on the importance of nursing attentiveness.

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