

Medications

The patient was taking D5-0.45% NaCl with KCl 20 mEq 12 ml/hr. The purpose of this medication was for fluid and electrolyte replenishment. This medication is used to help excrete urine and feces more frequently to lower the patient's bilirubin level. This is a hypotonic solution. Monitoring I&O's and labs for this patient is important. Considering this patient is receiving potassium, monitoring for arrhythmias or other cardiac changes is critical.

Relevant Lab Values/Diagnostics

The patient's glucose is on the low side at 50 mg/dL with the normal range from 74-100 mg/dL. The possible low glucose reading could be the cause of hyperbilirubinemia, otherwise glucose could be lower from not eating a couple hours prior to blood draw.

The patient's creatinine is on the low side as well at 0.44 mg/dL with the normal range at 0.55-1.30 mg/dL. The low creatinine could be the cause of insufficient calorie intake, otherwise hyperbilirubinemia can cause a decrease in creatinine labs due to poor renal function.

The patient's bilirubin total was 24.4 mg/dL with the normal range at 0.2-1.2 mg/dL. The result of these labs includes the diagnosis of hyperbilirubinemia.

The patient's AST level was 35 U/L with normal range at 5-34 U/L. Hyperbilirubinemia can cause liver function tests to increase slightly.

The patient's high on white blood cell count at 20.44 $10^3/uL$ with the normal range at 8.04-5.40 $10^3/uL$. Hyperbilirubinemia is the cause of these counts being high.

The MCH lab was high 37.2 g/dL with normal lab range being 31.3-35.6 g/dL. These slightly elevated labs are the result of hyperbilirubinemia.

The patient's MCHC was slightly higher with 36.6 g/dL with the normal range being 33.0-35.7 g/dL. These labs being high are because of the diagnosis of hyperbilirubinemia.

The patient's low MPV lab with 9.7 fL with the normal lab range being 10.2-11.9 fL. These slightly low values are the result from hyperbilirubinemia.

The patient's absolute neutrophils were elevated at 12.35 $10^3/uL$. The normal lab range is 1.60-6.06 $10^3/uL$. These high values were indicated by hyperbilirubinemia.

Absolute monocytes were slightly decreased due to hyperbilirubinemia. The lab value was 2.16 $10^3/uL$ with the normal range being 0.52-1.77 $10^3/uL$.

The normal lab range for absolute eosinophils is 0.12-0.66 $10^3/uL$ with the patient's lab value being elevated at 1.00 $10^3/uL$. These values were higher due to hyperbilirubinemia.

The patient's absolute immature granulocyte is 0.28 $10^3/uL$ with the lab range being 0.00-0.27 $10^3/uL$. This lab is slightly elevated due to hyperbilirubinemia.

Demographic Data

Admitting diagnosis: Hyperbilirubinemia

Age of client: 4 days old (1/14/2023)

Sex: Male

Weight in kgs: 2.82 kg

Allergies: N/A

Date of admission: 1/17/2023

Psychosocial Developmental Stage: Trust vs. Mistrust

Cognitive Development Stage: Sensorimotor Stage

Pathophysiology

Disease process: The catabolism of heme is where bilirubin is produced and is a breakdown product of hemoglobin. "First, heme is converted to biliverdin, releasing iron and carbon monoxide via the action of enzyme heme oxygenase" (Ansong-Assoku et al, 2022). There is an enzyme called biliverdin reductase, which converts the biliverdin to bilirubin. "This unconjugated bilirubin is hydrophobic and is transported in circulation to the liver bound to albumin, where it is conjugated with glucuronic acid in the smooth endoplasmic reticulum by the enzyme uridine diphosphate-glucuronosyltransferase (UGT)" (Ansong-Assoku et al, 2022). Conjugated bilirubin is excreted in bile and then excreted in feces by the gastrointestinal tract after being metabolized by the intestinal bacterial flora. "Some of the conjugated bilirubin is deconjugated in the GI tract by the action of beta-glucuronidase and is reabsorbed through the enterohepatic circulation" (Ansong-Assoku et al, 2022). Newborns usually have higher hemoglobin levels right after birth resulting in a shorter life span of red blood cells and limited conjugating ability of the newborn liver (Ansong-Assoku et al, 2022). During the research, I also found East Asians are more likely to have higher bilirubin, which is concerning due to the father's ethnicity being Asian. There was also a history of the mother's babies being jaundiced after birth. Hyperbilirubinemia primarily affects the skin causing jaundice, skin color, sclera, and tissues. The bilirubin quickly builds up in the blood, causing the pigment in the skin. During this process, the liver is damaged and does not move the digestive tract correctly. If not managed in time the bilirubin can become toxic to the brain resulting in brain damage.

S/S of disease: The signs and symptoms of this disease can include the baby's skin becoming jaundiced and the sclera turning yellow. The baby also is feeding poorly, causing the baby not to gain weight. The baby can also seem sick and difficult to awaken. All of these symptoms were presented in clinical trials by my patient. Some babies are more likely to experience high-pitched cries.

Method of Diagnosis: There are a couple of ways hyperbilirubinemia can be diagnosed; the most common forms include a physical exam of the jaundiced look—a laboratory test of a sample of the baby's blood, otherwise known as testing bilirubin total. The last procedure is a skin test with a transcutaneous bilirubin meter device. This test will measure the reflection of a special light shone through the skin (Mayo Foundation for Medical Education and Research, 2022).

Treatment of disease: The treat for this type of diagnosis would be phototherapy. In this case they used a bilirubin blanket, bilirubin bed, and bilirubin light therapy. Since the patient's bilirubin was severely high, they provided foil over the incubator to reflect the light back to the patient. Depending on the severity of the patient's condition it could take a couple days to lower their count.

Admission History

The parents brought the baby in due to the patient looking jaundiced. After going to the first appointment after birth with the primary care provider, the provider sent the family to the hospital due to concerning levels of bilirubin. The symptoms weren't tried to be managed due to parents having a previous child with the same condition.

Medical History

Previous Medical History: N/A

Prior Hospitalizations: N/A

Past Surgical History: Circumcision (1/15/2023)

Social needs: N/A

Active Orders

Bilirubin light therapy is relevant to this diagnosis because it lowers the serum bilirubin level by allowing the baby's liver to break down and remove the bilirubin from the blood.

Bilirubin blanket is relevant to this diagnosis causing a decrease in the yellowing of the skin and sclera. There is eye protection used during this intervention for reducing damage to the eyes. The woven fibers in the blanket allow the light to transfer to the baby.

Bilirubin bed is relevant to this diagnosis to reduce the bilirubin allowing the light to shine directly on the baby's skin. The baby's waste is then excreted through urine and feces.

Assessment

General	Patient responds to stimuli such as changing their diaper, feeding, and picking him up. I was unable to assess for orientation due to the patient being 4 days old. Patient was in no distress and appearance was appropriate.
Integument	The patient's skin was jaundiced around the eyes and abdomen. I was unable to assess the patient's sclera for jaundice due to the patient not opening his eyes. The patient's skin has dry patches on the feet and in the armpits. The patient's temperature is warm. Turgor is non-tenting. Normal quantity, distribution, and texture of hair. The patient scored a 12 on the Braden scale which is a high risk. However, the patient is only 4 days old which increases the risk. No rashes, bruises, or wounds noted.
HEENT	The patient's skull and face is symmetrical. I was unable to assess thyroid movement and trachea due to patient unable to swallow on command. I was unable to assess the patient's eyes and ears due to the patient being in the incubators and the patient not wanting to open his eyes. Septum is midline. There are no teeth present; mucous membranes were moist. There was no nasal discharge, abrasions, or edema present. Both fontanelles were present on the patient's head.
Cardiovascular	Clear S1 and S2 without murmurs and gallops. Normal rate and rhythm. Cap refill was less than 3 seconds. No edema was present. Pulse was not mechanically 3+.
Respiratory	Respirations were regular with the use of accessory muscles which is common in neonates. Normal rate and pattern of respirations. Lung sounds were clear anterior bilaterally. Lung aeration is equal. No wheezes, rhonchi, or crackles noted.
Genitourinary	The patient had a moderate amount of yellow, clear urine. The patient was circumcised. There is no catheter present. I was unable to assess pain with urination due to patient not being able to speak.
Gastrointestinal	Bowel sounds are active x4. Patient is on a normal diet eating every 2-3 hours with at least 1 ounce. Patient weighs 2.82 kg and is 49.78 cm tall. The last bowel movement was January 18th, 2023. There is no distention, incision, scars, drains, or wounds noted. Abdomen is soft, nontender upon palpation. There is no feeding tube, nasogastric tube, or ostomy noted.
Musculoskeletal	There is a passive range of motion. I was unable to assess strength due to the patient being in the incubator and being 4 days old. Nail beds are smooth. I was unable to assess PERLLA due to the patient not wanting to open his eyes. Morse Fall risk would be a score 20 which is a low risk. However, the mother stated the patient likes to squirm in the incubator so shutting the incubator doors is necessary.
Neurological	I was unable to assess for cognitive and orientation due to the patient being 4 days old. Patient is unable to speak but does cry when awake. The patient does awaken when changing his diaper, feeding, and being lifted up. Unable to assess for hand grips and pedal pushes and pulls.
Most recent VS (highlight if	Time:1100

abnormal)	<p>Temperature: 37.7 C</p> <p>Route: Axillary</p> <p>RR: 53</p> <p>HR: 146 bpm</p> <p>BP and MAP: 75/38 mmHg (48)</p> <p>Oxygen saturation: 98%</p> <p>Oxygen needs: Room air</p>
Pain and Pain Scale Used	The patient scored a 0 on the FLACC scale.

<p>Nursing Diagnosis 1</p> <p>Ineffective infant feeding pattern related to decreased PO intake as evidenced by parents only feeding one ounce every five hours during the night.</p>	<p>Nursing Diagnosis 2</p> <p>Neonatal jaundice is related to family history of hyperbilirubinemia as evidenced by yellowing of skin and increase in total bilirubin.</p>	<p>Nursing Diagnosis 3</p> <p>Impaired skin integrity related to bilirubin increase and jaundice as evidenced by dry skin in armpits and feet.</p>
<p>Rationale</p> <p>The baby is diagnosed with hyperbilirubinemia which can already cause a decrease in baby's weight. The baby cannot afford to lose weight during this stage in life. Therefore, the baby needs to feed every two to three hours at least one ounce.</p>	<p>Rationale</p> <p>The baby was admitted due to recent discoloration or jaundice of the skin.</p>	<p>Rationale</p> <p>The patient had patches of dry skin on their armpits and feet. If nursing personnel does not put ointment on the area it could turn into a pressure sore.</p>
<p>Interventions</p> <p>Intervention 1: Weigh the baby at the same time using the same scale to assure he is not losing weight.</p> <p>Intervention 2: "Assess parents' knowledge of feeding techniques to help identify and clear up misconceptions" (Phelps, 2020, p. 232).</p>	<p>Interventions</p> <p>Intervention 1: Collect and monitor laboratory blood specimens as ordered or per unit protocol.</p> <p>Intervention 2: "Coordinate care and facilitate communication between family, nursing staff, pediatrician, and lactation specialist" (Phelps, 2020, p. 295).</p>	<p>Interventions</p> <p>Intervention 1: Perform prescribed treatment regimen for the skin condition.</p> <p>Intervention 2: Inspect the patient's skin as often as the unit's protocol stands for.</p>

<p>Evaluation of Interventions The newborn increased PO intake by the parents feeding the patient every two to three hours at least one ounce.</p>	<p>Evaluation of Interventions The patient's bilirubin decreased in the remaining areas prior to discharge.</p>	<p>Evaluation of Interventions The dry skin patches decreased with the patient's prescribed treatment prior to discharge.</p>
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References (3):

- Ansong-Assoku, B., Shah, S. D., Adnan, M., & Ankola, P. A. (2022). *Neonatal jaundice*. National Library of Medicine: National Center for Biotechnology Information. <https://www.ncbi.nlm.nih.gov/books/NBK532930/>
- Mayo Foundation for Medical Education and Research. (2022). *Infant jaundice*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/infant-jaundice/diagnosis-treatment/drc-20373870>
- Phelps, L.L. (2020). *Sparks and Taylor's nursing diagnosis reference manual* (11th ed.), p. 232, 295. Wolters Kluwer.