CASE STUDY 2: Infant

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GENDER: F
AGE: 8 months old
SETTING: Hospital
ETHNICITY: White American
PSYCHOSOCIAL: Single teenage mother, Family history of abuse
LEGAL: Mandatory reporting
ETHICAL: Suspected abuse

THE INTEGUMENTARY SYSTEM

Overview: This case requires knowledge of burns, child abuse, as well as an understanding of the client’s background, personal situation, and mother-child attachment relationship.
Client Profile

Kyla is an 8-month-old infant who lives with her mother, grandmother, and great grandmother in Cincinnati, Ohio. Her mother, Sierra, is a 16-year-old who stopped going to school after she became pregnant by her on-again, off-again 18-year-old boyfriend, Kyle, who visits Sierra but shows no interest in Kyla. He frequently becomes annoyed and leaves when Kyla needs to be fed or have her diapers changed. Sierra’s father was very abusive to both Sierra and her mother as Sierra was growing up. He died 6 months ago as a result of a knife wound that occurred during a fight at a local tavern. He and Sierra’s mother lived together with their five children and when he worked, he worked for a minimum wage that barely fed his family. Kyla’s aunts and uncles (Sierra’s three sisters and one brother) keep in contact with their mother and sister, but are busy with their own lives and families. Although Sierra participates in Kyla’s care, her mother is the stable caregiver when she is not working. The relationship between Sierra and her mother has been strained since Sierra became pregnant and frequently the two engage in heated arguments over the increased financial stress related to Kyla’s needs and Sierra’s refusal to seek employment. Sierra’s grandmother is in poor health and requires frequent visits to the emergency room as a result of unstable angina.

Case Study

At 2135 hours, Kyla is brought wrapped in a bath towel by her grandmother to the emergency department at the local hospital. The admitting nurse observes that Kyla is crying vigorously and is unable to be consoled. She is in no apparent respiratory distress. According to the grandmother, Kyle came over to see Sierra while Kyla’s grandmother was out at the grocery store. When she returned, Kyla was screaming. Sierra said that she and Kyle were talking and Kyla “got real fussy, so we decided to give her a bath to get her to quiet down, but she just kept screaming.” Kyla’s grandmother wrapped Kyla in a bath towel and brought her to the hospital because she thought that she was sick because “she was so red.” On further assessment the nurse notes that Kyla has blisters on her feet, lower legs, and buttocks, and bruises on her upper arms. The health care provider examines Kyla and arranges for her to be transferred by AirFlight to Cincinnati Shriners’ Hospital to be admitted with second-degree burns of her buttocks, genitalia, legs, and feet. Health care providers at the burn center estimate Kyla’s burns as 34% of her total body surface area (TBSA) using the “Estimation of the Extent of Burns in Children” chart. Although Sierra calls every other day to ask about Kyla’s condition, she doesn’t visit her daughter. Kyla’s grandmother stays at the hospital with Kyla.
Questions

1. Discuss your impressions about the above situation.
2. Discuss the factors in this situation that would place Kyla at risk for child abuse.
3. Using developmental theory, discuss Sierra’s level of growth and development.
4. The health care providers determined that Kyla’s development was appropriate for an 8-month-old infant. Discuss what you would expect when assessing Kyla’s growth and development.
5. Discuss how the health care providers arrived at 34% of Kyla’s TBSA experiencing second-degree burns.
6. Describe the characteristics of second-degree burns.
7. Using the 4:2:1 rule for calculating maintenance rate of intravenous fluids for Kyla, who weighed 3.18 kg (7 lb) at birth and has experienced a weight gain within normal limits for her age, calculate her hourly IV rate.
8. Determine Kyla’s priority nursing diagnoses on admission to the burn center, discussing why each is a priority.
9. Discuss your impressions about why Sierra doesn’t visit Kyla at the hospital.
10. Discuss what members of the health care team should be involved in Kyla’s care and recovery.
11. Discuss your feelings about child abuse and how you would feel if you were a nurse caring for Kyla in this situation.

Questions and Suggested Answers

1. **Discuss your impressions about the above situation.** Kyla is a normal 8-month-old infant who is the victim of child abuse. The primary concern of the health care team is to treat her injuries with a minimum of complications and report their suspicions to the legal authorities. Kyla was born into an environment where she added to the financial stress already present in this family. Her mother is an adolescent who was a victim of child abuse as well as being in a situation in which her mother also was abused. Although her father was abusive, Sierra also has had to deal with his violent death. She has dropped out of school so she doesn’t have daily contact with peers, who provide the primary sense of belonging and self-esteem for an adolescent. Her teen development has been arrested by all of these factors. In addition, she may blame Kyla for her not being with her friends participating in normal adolescent activities. Sierra’s grandmother also poses a stressor in this situation as Sierra must care not only for Kyla but also for her grandmother while her mother is at work. She has most likely experienced feelings of wanting to escape from this situation. Kyla still requires a great deal of care, and it is difficult for an adolescent who by normal growth and development is focused on her self and establishing her own identity to focus on the care of an infant. Kyle’s presence in her life does not appear to be a healthy situation.
2. Discuss the factors in this situation that would place Kyla at risk for child abuse. Kyla was born into an environment in which abuse is the norm. Many abusers were abused themselves, as was Kyla’s mother. Kyla posed additional financial stress on the family which is a characteristic of a child who is abused. Kyla’s mother does not seem involved in her care, as one would expect. Another characteristic of an abused child is that he or she is the product of an unwanted pregnancy. Her mother’s level of growth and development also contributes to this situation because having an infant does not promote normal adolescent growth and development, which can result in resentment and anger. Kyla’s father and his behavior toward Kyla also presents a potential threat.

3. Using developmental theory, discuss Sierra’s level of growth and development. Sierra is an adolescent (13–20 years of age) and according to Erikson’s theory, she is involved in “identity versus role confusion.” During adolescence, children see themselves as distinct individuals who are unique and different from everyone else. During this time, the adolescent tends to rebel against persons she sees as authority figures. The adolescent sometimes has a confrontational relationship with the same-sex parent and is especially close to the opposite-sex parent. Risk-taking behavior (unprotected sex, smoking, drug use, speeding, etc.) is very common as the adolescent rebels against established social rules and mores. In their attempt to develop their own identity, adolescents rely primarily on peers for a sense of belonging. Consequently, behaviors are frequently the result of peer pressure. Adolescents growing up in a dysfunctional environment may “run away” as an attempt to escape this environment. According to Piaget, the adolescent is involved in formal operational thinking, allowing him or her to not only practice concrete thinking but also think about what is “possible.” The adolescent is very concerned about how he or she is seen by others, especially peers. Most of the adolescent’s time is spent in school and participating in school activities. Hormonal and growth changes also impact the adolescent, with this level of growth and development being the second and final growth spurt during the lifespan. Sex hormones are secreted by the ovaries, testes, and adrenals. Menstruation begins and mood swings frequently affect adolescent personalities. Breast development occurs as well as fat deposits to fill out and contour the body, preparing it for childbearing. All of these factors contribute to this stage of growth and development being very challenging and confusing for the adolescent.

4. The health care providers determined that Kyla’s development was appropriate for an 8-month-old infant. Discuss what you would expect when assessing Kyla’s growth and development. Birth weight doubles in the first 6 months and triples by 1 year of age. Primary infant nutrition remains
formula or breastfeeding, which should continue until 1 year of age. The
addition of solid foods begins in the second 6 months of life and the infant
eats six or seven times a day. An 8-month-old infant should have received
the first three sets of immunizations against communicable diseases. Kyla
should be sleeping 9–11 hours at night and another 4–6 hours in naps.
Physically, the 8-month-old infant has lost most of the newborn reflexes (as
reflexes) except Babinski (which disappears at 9 months of age), ciliary
(which lasts indefinitely), and doll’s eyes (which may persist into childhood).
An 8-month-old can sit steadily unsupported, crawl and pull up, stand with
support, and use the pincer grasp. These infants can hold their bottles and
alternate hands while feeding. Because of development in vision, they are
attracted to bright colorful objects and enjoy listening to themselves make
vocal sounds. They cry if in need, including the need to be held and cuddled
and if anxiety is present or strangers are around.

5. Discuss how the health care providers arrived at 34% of Kyla’s TBSA
experiencing second-degree burns. According to the “Estimation of the
Extent of Burns in Children” chart used by many burn centers, Kyla’s burn
percentage of TBSA was estimated by:

- Right buttocks = 2½%
- Left buttocks = 2½%
- Genitalia = 1%
- Right thigh = 5½%
- Left thigh = 5½%
- Right leg = 5%
- Left leg = 5%
- Right foot = 3½%
- Left foot = 3½%

These represent an emersion pattern of child abuse using hot water. The
percentages are adjusted according to the child’s age. For an infant the rest
of the TBSA estimation percentages include:

- Head = 19%
- Neck = 2%
- Anterior trunk = 13%
- Posterior trunk = 13%
- Upper arm = 2½%
- Lower arm = 3%
- Hand = 2½%

As the child grows older and into adulthood, most of the percentages
remain the same except the head percentage, which decreases with age as
the thigh and leg percentages increase with age.
6. **Describe the characteristics of second-degree burns.** Second-degree burns are termed partial thickness burns. They are characterized by destruction of the epidermis and superficial or deep dermis with resulting loss of function (see Fig. 2-1). The loss of function depends on how much of the dermal layer is involved. Within minutes of the burn, blisters form. Fluid continues to accumulate in the blisters as the inflammatory response is triggered, sending neutrophils, macrophages, basophils, and eosinophils. Phagocytosis is the key mechanism for a successful outcome of inflammation. This process engulfs microorganisms and rids the body of debris following tissue injury. During phagocytosis, the neutrophils and macrophages adhere to the injured tissue and any microorganisms that may have entered the wound. They then ingest the cellular debris, forming a phagosome. This is followed by degradation of the debris. Superficial partial thickness burns require 7–12 days to heal as long as no infection occurs. Deep partial thickness burns require one to several months to heal and carry a higher risk of infection.

7. **Using the 4:2:1 rule for calculating maintenance rate of intravenous fluids for Kyla,** who weighed 3.18 kg (7 lb) at birth and has experienced a weight gain within normal limits for her age, calculate her hourly IV rate. Infants normally double their birth weight in the first 6 months and gain approximately 1 pound each month after that until 1 year of age, at which time the birth weight typically has tripled. Given Kyla’s birth weight of 7 lb or 3.18 kg, at 6 months her weight would be 14 lb or 6.36 kg. At 8 months her weight should be approximately 16 lb or 7.27 kg. Using the 4:2:1 rate, Kyla should receive 4 mL/kg per hour or 50.89 mL/hour.

8. **Determine Kyla’s priority nursing diagnoses on admission to the burn center,** discussing why each is a priority.
   a. High risk of infection related to loss of skin and tissue integrity
      (1) Kyla’s immune system is still immature, increasing her risk of infection secondary to the burns.
      (2) Depending on whether she experiences superficial or deep partial thickness burns, her risk of infection increases with the deeper wounds.
      (3) Being in a hospital exposes Kyla to the potential of nosocomial infection in her wounds.
   b. Acute pain related to nerve irritation at site of the burns
      (1) Second-degree burns are very painful, and considering the locations of her burns, any movements of her lower extremities would create more pain.
      (2) Procedures including bathing, dressing changes, intravenous initiation, debridement (if necessary) would all be painful.
Figure 2-1  Skin layers involved in burn injuries: First-degree burn; Second-degree burn; Third-degree burn; Fourth-degree burn
(3) The nerve endings of newborns and infants remain very sensitive to painful stimuli because of the thinness of their skin and their acute tactile senses.

c. Deficient fluid volume related to inflammatory process and third-spacing of fluid at burn site. Blisters filled with fluid occur almost immediately following a burn and more fluid is sent to the injury site as a result of the inflammatory process. The fluid and electrolyte balance in young children is very fragile, with imbalances occurring in these clients with much less fluid loss than would be required in an older child or adult. If the blisters lose the skin covering, fluid loss to evaporation will place them at even higher risk.

d. Imbalanced nutrition: Less than body requirements related to nutritional demands. Nutritional requirements increase depending on the TBSA affected and the depth of the burn. A common formula used is two to three times the normal caloric intake with 23% of their nutrition in the form of proteins. This usually requires some type of enteral or parenteral supplementation. If total parenteral nutrition (TPN) is needed, the presence of the central venous access device (CVAD) and the glucose content of the TPN pose further risks for infection. The use of a gastrostomy tube for enteral feedings would also increase the risk of infection.

e. Sleep pattern disturbance related to critical care environment and frequent assessments and care. In critical care areas, assessments are frequent 24 hours a day. Monitoring equipment involves both additional lights and sounds that can disturb sleep. If not properly managed with an opioid analgesic (morphine sulfate is the gold standard for management of moderate to severe pain in young infants, whereas fentanyl citrate may be used in children older than infants). Kyla is at risk for disorganized infant behavior related to extended hospitalization and family relationships.

f. Infants are involved in Erikson’s “trust versus mistrust” developmental crisis. Not having her mother with her and having her primary caregivers (nurses) change every 12 hours coupled with her normal stranger anxiety can interfere with normal development. Infants at Kyla’s age are increasingly using the muscles in the legs to develop gross motor skills, which the location of her burns will at least temporarily delay. The grandmother has been the primary caregiver and is not in good health. She should be encouraged to visit and interact with Kyla whenever possible.

9. Discuss your impressions about why Sierra doesn’t visit Kyla at the hospital. Sierra is probably afraid that if she visits Kyla at the hospital she may
be arrested, knowing that Kyla’s burns were not an accident. She may be afraid that if she visits Kyla and is questioned about Kyla’s injuries, Kyle may retaliate against her. Another possible reason could be that she may be enjoying being a teenager without having an infant to care for. She may be going out with her friends or spending time with Kyle. Sierra may be having difficulty with her role as Kyla’s mother and may not know how to connect with Kyla in a parent-infant relationship. We don’t know whose decision it was for Sierra to keep Kyla, or whether she was coerced by other family members. Sierra may not have felt the decision was hers to make.

10. Discuss what members of the health care team should be involved in Kyla’s care and recovery. It is mandatory by law to report suspected child abuse to the appropriate child welfare agency. Health care workers cannot return a child to a potentially abusive environment. Conclusive proof is not necessary for a person to report suspected child abuse. The laws were developed to protect children. The health care provider needs to consult with the social worker to evaluate the situation, local child welfare agent to evaluate whether it is safe to return Kyla to the home environment after recovery, local authorities to determine whether charges of child abuse should be brought against Sierra and Kyle, and recreational therapist to facilitate Kyla’s growth and development and help her cope with her injuries and care.

11. Discuss your feelings about child abuse and how you would feel if you were a nurse caring for Kyla in this situation? This will involve you addressing your feelings about child abuse, unwed parenthood, adolescent pregnancy, and caring for an infant with a burn injury. It also will require you to discuss how these biases may affect care.

References

Cincinnati Shriners Hospital, 3229 Burnet Avenue, Cincinnati, OH 45229-3095.
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St. Louis, MO: Mosby.

Shriners Burn Care Hospitals: [www.schrinerhq.org](http://www.schrinerhq.org)