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## Clinical Communications

### VITAMIN K DEFICIENCY MIMICKING CHILD ABUSE

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□ **Abstract**—Supplemental vitamin K is required for normal hemostasis in infancy. Infants born outside the hospital may not receive prophylactic vitamin K. They may suffer from bleeding into various tissues and are likely to present to the emergency department. This report describes an infant born at home who presented with intracranial bleeding and signs and symptoms consistent with child abuse. Further investigations confirmed the diagnosis of Vitamin K deficiency. Although it is important to consider child abuse when the history and examination are consistent with the diagnosis, it is equally important to consider other potential diagnoses including Vitamin K deficiency. © 2005 Elsevier Inc.

□ **Keywords**—vitamin K deficiency; bleeding; child abuse; shaken baby syndrome; intracranial hemorrhage

#### INTRODUCTION

Supplemental vitamin K is required for normal hemostasis in infancy. The insufficient amount of vitamin K that is transferred from mother to fetus renders the infant prone to bleeding complications (1). Current recommendation by the American Academy of Pediatrics (AAP) is to administer vitamin K (1.0 mg i.m.) in the first 24 h of life to prevent vitamin K deficiency bleeding (2). Infants born outside the hospital may not receive prophylactic vitamin K. They may suffer from bleeding into various

tissues and are likely to present to the Emergency Department (ED).

This report describes an infant with late-onset bleeding due to vitamin K deficiency. The infant presented with clinical features and symptoms consistent with child abuse. Although it is important to consider child abuse when the history and examination are consistent with the diagnosis, it is equally important to consider other potential diagnoses. This approach may not only lead to appropriate early therapy, but can also avoid the emotional trauma to a family given an erroneous label of child abuse.

#### History

A previously healthy 6-week-old girl presented to an outlying ED with a chief complaint of 'not eating well' for 1 day. The family denied a history of fever, vomiting, diarrhea, cough, rhinorrhea, rashes, or ill contacts. The infant had not yet had an initial examination by a physician due to her parent's religious beliefs that forbid traditional medical care. She was exclusively breastfed. There were no maternal complications or infections during the pregnancy, and a midwife delivered the infant at home. There was no significant family history to explain her illness, and there were no siblings. The infant was on no medications and had no known allergies.

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**Figure 1. Nodular bruising on the radial aspect of the left wrist.**

#### *Physical Examination*

At the outlying ED the infant was lethargic and pale appearing, with a weak cry. Vital signs included a temperature of 36.7°C (98°F) (rectal), pulse 155 beats per minute, blood pressure 121/45 mm Hg, respiratory rate 38 breaths per minute, and oxygen saturation 100% on room air. The anterior fontanel was bulging and there was poor muscle tone. A slight ptosis of the left eyelid was seen. No retinal hemorrhages were present. The infant moved all four extremities appropriately when stimulated. Examination of the head, ears, nose, and throat were normal. The heart, lung, and abdominal examinations were also normal. The skin showed bruising on the left wrist (Figure 1) and chest wall (Figure 2). A diffuse swelling of the left elbow was also noted. Distal pulses were present and the capillary refill was < 2 s.

#### *Initial Laboratory and Radiographic Results*

The complete blood count (CBC) revealed a white blood cell count of 22,700 mm<sup>3</sup>, hemoglobin of 5.6 gm/dL, hematocrit of 16.6%, and platelet count of 150,000 mm<sup>3</sup>. Urinalysis revealed 5–8 white blood cells per high power field, and leukocyte esterase was positive.

Electrolytes revealed sodium of 126 mEq/L, potassium 5.1 mEq/L, chloride 88 mEq/L, bicarbonate 22 mEq/L, and glucose of 80 mg/dL. The blood urea nitrogen was 16 mg/dL, and creatinine 0.6 mg/dL. Of significance was a prothrombin time (PT) > 130 s and an

activated partial thromboplastin time (PTT) > 96.4 s. The chest radiograph was normal. The radiograph of the left elbow revealed no acute fracture but periosteal elevation and calcification mimicking a healing fracture (Figure 3). Computed tomography (CT) scan of the head revealed multiple areas of subdural and intraparenchymal hemorrhage, with a midline shift to the right (Figure 4).

#### *Clinical Impression and Emergency*

##### *Department Course*

In view of the bulging fontanel, weak cry, lethargy, bruising, and swelling of the left elbow, nonaccidental trauma with intracranial injury was the presumptive diagnosis. During the ED stay, the infant developed a rightward gaze and began hypoventilating. She was intubated, mechanically ventilated, and stabilized for transport to a children's hospital for ongoing critical and subspecialty care. The case was reported to the state child protection agency before transfer.

##### *Clinical Course in the Critical Care Unit*

There were no untoward events during transportation. On arrival at the pediatric critical care unit she was extremely pale, pharmacologically paralyzed, sedated, and was being ventilated. Vital signs included a blood pres-

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