Review Article

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Late Hemorrhagic Disease of Newborn in Infants with Hospital Deliveries

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Abstract

The low concentration of vitamin K in human breast milk and the predisposition to vitamin K deficiency bleeding following exclusive breast feeding is emerging as a matter of concern especially in developing countries where exclusive breast feeding is vigorously advocated to promote optimal health in the infant. Most reports of late HDN have been in babies born at home and not given vitamin K prophylaxis, In rural areas of our country (due to lack of knowledge of vit. K prophylaxis) late HDN is not uncommon in Hospital deliveries also.

Keywords: Hemorrhagic Disease of Newborn; VIT. K prophylaxis.

Introduction

In 1894, Townsend described a self-limited bleeding condition that usually occurs 1-5 days after birth in patients with non classic hemophilia.[1,2,3] The term vitamin K originated from *koagulations-vitamin* in German.[3] Henrik Dam and Edward Doisy won the 1943 Nobel Prize for the discovery and functions of vitamin K. Subsequent research has provided significant contributions to current knowledge of vitamin K and its association with coagulation factors, namely the vitamin K–dependent coagulation factors II, VII, IX, and X[4] & protein C, S Clarke and Shearer wrote a brief but excellent history of vitamin K deficiency bleeding (VKDB) in neonates.[5]

Newborns are relatively vitamin K deficient for a variety of reasons. They have low vitamin K stores at birth, vitamin K passes the placenta poorly, the levels of vitamin K in breast milk are low and the gut flora has not yet been developed (vitamin K is normally produced by bacteria in the intestines)

Hemorrhagic disease of the newborn (HDN) has three distinct patterns of presentations.[6-8] Early HDN is seen within 24 hours of birth in infants whose mothers have been on anticonvulsant or anti-tuberculous drugs during pregnancy. Classic HDN occurs between the 2-5 days of life with most of the cases being idiopathic. Late HDN is characterized by bleeding in infants aged 2-16 weeks due to severe vitamin K deficiency, occurring primarily in exclusively breast fed infants [7,8]. It is associated with significant morbidity and mortality.[6,7] The rate of late HDN ranges from 4.4-7.2 cases per 100,000 births.

Case Report

We report two cases with Late Hemorrhagic disease of Newborn, both were male in gender and were delivered in Hospital but did not received Vitamin K at birth.

A six weeks male infant presented to us with history of loose stools 2 days before, convulsions, poor feeding and reduced

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activity. He was first issue of Non consanguineous marriage, He was delivered by normal vaginal delivery and was on exclusive breast feeds. On physical examination he had echymosis on right thigh where he had received DPT vaccine 3 days back. He was comatose, anterior fontanel was bulging with loss of pulsations. On asking further details, had he had not received vit K at birth and there was no history of any family member suffering from bleeding disorder. Mother not received any drugs (antiepileptics) during pregnancy.

On investigations repeated complete blood counts were normal, repeated CRP were negative, electrolytes blood sugar were normal. Blood culture report was normal; CSF was kept on hold when we got PT, PTTK reports which were grossly prolonged. Bleeding time was normal clotting time prolonged. LFT was normal, MRI brain showed *subdural haemorrhage intemporo-parieto-occipital region & bilateral cerebellar area.*treated with iv steroids, FFP 10 ml//kg VIT K & again PT, PTTK were repeated after 12 hours, 48 hours which showed gradual improving trends. And on discharge perfectly normal PT, PTTK.

We also report another patient with similar presentation only differs in presentation such as presented with altered sensorial but no convulsions MRI brain shows *subacute hematoma in right parieto occipital region & infarct in right fronto temporal parietal region.* On follow up of both patients we found that both had significant neurodevelopmental delay and first child suffering from seizure disorder.

Discussion

HDN is a rare disease with high mortality and morbidity[9]. It is one of the most frequent causes of intracranial haemorrhage in the first year of life.

Newborns have only 20-50% of adult coagulation activity. Lack of vitamin K administration at birth, exclusive breast feeding, chronic diarrhea and prolonged use of antibiotics make them more prone to vitamin K deficiency bleeding [10]. Almost 2/3rd of the babies with late HDN present with serious intracranial bleeds leading to high morbidity and subsequent mortality. Bleeding occurs because of insufficient vitamin K absence (PIVKA) levels is not considered essential in the case definition (PIVKA-II levels are elevated in vitamin K deficiency).

As in both our cases we have done D dimer assay to rule out DIC. D dimer assay was normal PIVKA levels were not done due to non availability.

Late HDN may be seen at any time after eight days and before twelve months, but is frequent between four to eight weeks. It generally presents with intracranial haemorrhage, injection haematoma and widespread deep ecchymosis. In addition, gastrointestinal system and superficial skin haemorrhage may be seen.[11,12] Breast-fed infants and newborns with inadequate vitamin K prophylaxis are under the risk of haemorrhagic disease. The amount of vitamin K in mother's milk is not sufficient. HDN is more frequent in babies who are born at home. [13] Vit K deficiency can also occur due to secondary causes. Chronic diarrhea, cystic fibrosis, biliary atresia, celiac disease, alpha 1-antityripsin deficiency, abetalipoproteinemia and a history of warfarin usage for a long period may induce vitamin K deficiency.[13] Risk of intracranial haemorrhage in late HDN is reported in 50-80% cases.[14]

Mortality is reported in 14-50% cases by various authors.[12] Administering vitamin K to every newborn at birth can impede the disease, which has a high morbidity and mortality[12,13].

Vitamin K prophylaxis reduces the incidence of late HDN from 5.1 cases per 100,000 births by 90%. A single parenteral dose reduces the risk by a factor of 14.3[15]. Many hospitals have adopted a policy of selective prophylaxis, where high risk infants are given vitamin K prophylaxis. There was a resurgence of late HDN after the practice of selective prophylaxis[16], which led to the introduction of oral vitamin K. The results of the meta-analysis on vitamin K administration have shown that intramuscular vitamin K1 is

more effective than oral vitamin K in the prevention of late HDN.[6,17] Single oral dose of 1 mg vitamin K is not effective, and the efficacy is increased with 3 doses of 2 mg (at birth, 1-2 weeks and 4 weeks), rather than 1 mg dose.[17] Studies have shown that a daily dose of 25 μg of vitamin K1 given orally following an initial dose of 1 mg after birth may be as effective as intramuscular vitamin K.[12] The recommendation of the American Academy of Pediatrics is to give vitamin K1 to all newborns as a single intramuscular dose of 0.5 to 1 mg.[18]

The low concentration of vitamin K in human breast milk and the predisposition to vitamin K deficiency bleeding following exclusive breast feeding is emerging as a matter of concern especially in developing countries where exclusive breast feeding is vigorously advocated to promote optimal health in the infant. Most reports of late HDN have been in babies born at home and not given vitamin K prophylaxis. In rural areas of our country (due to lack of knowledge of vit. K prophylaxis) late HDN is not uncommon in Hospital deliveries too.

Conflicts of Interest

None

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