

Intracranial hemorrhage related with late hemorrhagic disease of the newborn

Yenidoğanın geç hemorajik hastalığı ile ilişkili intrakraniyal kanama

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Abstract

Purpose: To evaluate the clinical and radiological findings of twenty-two patients who had intracranial hemorrhage related with late hemorrhagic disease of the newborn (HDN).

Material and Methods: The ages ranged from 31 to 61 days (mean 45.32 ± 10.37 days) and all had intracranial hemorrhage related with late HDN.

Results: Of the patients, fourteen were male (63.6%) and 8 were female (36.4%). All were full-term babies. None were administered vitamin K at birth and all were breast-fed. There was no history of protracted diarrhoea or antibiotic usage. Major complaints on admittance were convulsions (63.6%), vomiting (59%) and irritability (45.4%). Intracranial hemorrhage was mostly localized as subdural hematoma.

Conclusions: Intracranial bleeding risk of late HDN is high and the incidence is reported as 50-80%. Hemorrhage related with vitamin K deficiency is still a problem today. It is upsetting that babies who are born in hospital are admitted with HDN as well as home births. Therefore, medical personnel who deal with the newborn should be educated in this simple procedure. In this way, it will be possible to decrease the morbidity and mortality of the newborn.

Key Words: **Hemorrhagic Disease of Newborn; Intracranial hemorrhage; Vitamin K deficiency.**

Özet

Amaç: Yenidoğanın geç hemorajik hastalığına bağlı olarak gelişen intrakraniyal kanamalı 22 hastanın klinik ve radyolojik bulgularının değerlendirilmesi.

Gereç ve Yöntem: Çukurova Üniversitesi Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları Yoğun Bakım Ünitesi ve servisinde yatarak izlenen 22 intrakraniyal kanama olgusu çalışmaya alındı. Hastaların yaşları 31 gün ile 60 gün (ortalama: 45,32±10,37) arasında değişmekteydi ve tüm hastalar da yenidoğanın geç hemorajik hastalığına bağlı olarak intrakraniyal kanama mevcuttu.

Bulgular: Çalışmaya alınan hastaların 14'ü (%63,6) erkek ve 8'i (%36,4) kız idi. Hepsisi term doğan bebeklerdi. Doğum sonrasında hiçbir olguya K vitamini verilmediği ve hastaların hepsinin anne sütü ile beslendiği belirlendi. Hiç birinde uzamış ishal ve antibiyotik kullanım öyküsü yoktu. Hastaneye başvurular sırasındaki başlıca yakınmalar; konvülsiyon (%63,6), kusma (%59,0) ve huzursuzluk (%45,4) idi. İntrakraniyal kanamanın lokalizasyonu olarak en sık subdural hematoma (%86,3) saptandı.

Sonuç: Yenidoğanın geç hemorajik hastalığına bağlı olarak intrakraniyal kanama riski yüksek ve insidansı %50-80 olarak bildirilmektedir. K vitamini eksikliğine bağlı kanamalar günümüzde halen bir problemdir. Evde doğan vakaların yanında, hastanede doğan vakalarda da görülmesi oldukça üzücüdür. Bu nedenle, doğumdan hemen sonra bebekle karşılaşan sağlık personelinin eğitimi ile bu basit prosedürün uygulanması sağlanmalıdır. Böylece yenidoğan morbidite ve mortalitesini azaltmak mümkündür.

Anahtar Kelimeler: **İntrakraniyal kanama; Vitamin K eksikliği; Yenidoğanın hemorajik hastalığı.**

Introduction

Hemorrhagic disease of the newborn (HDN) can also be defined as vitamin K (vit K) deficiency related bleeding. Deficiency of vit K leads to bleeding by causing a shortage in the activity of coagulation factors II, VII, IX and X. HDN is one of the most frequent bleeding disorders in infancy (1). It is classified as early, classical and late-onset disease according to the time bleeding occurs. Early HDN is diagnosed when the bleeding begins in the first 24 hours of postnatal period. It is frequently seen in babies whose mothers use isoniazid and/or rifampicin for the treatment of tuberculosis. Antiepileptics such as phenytoin and phenobarbital can lead to early HDN although less frequently. Classical HDN occurs between 2-5 days of neonatal period and life-threatening bleeding is rare. Late-onset disease can be seen during infancy but predominantly in 4-8th weeks of life. Its incidence is 4-25 / 100000 births in the western countries but as high as 25-80 / 100000 in eastern countries (2,3). Administering vit K to every newborn at birth may decrease the frequency of late-onset HDN.

In the present study, twenty-two cases treated for intracranial hemorrhage related with late hemorrhagic disease in our intensive care unit for four years period were evaluated.

Material and Methods

Twenty-two cases of intracranial hemorrhage, which were followed at Cukurova University Faculty of Medicine, Department of Pediatrics, Intensive Care Unit between January 1999–January 2003 were included in the study. Late hemorrhagic disease is diagnosed according to the following criteria (4,5):

- 1- Bleeding occurring after the 7th day of life
- 2- Thrombocyte count is normal
- 3- Differential count is normal
- 4- Prothrombin time (PT) and partial thromboplastin time (PTT) are extended
- 5- Bleeding stopping and PT/PTT returning to normal after vitamin K is administered.

Patients who had icterus, hepatomegaly, liver function test impairment or long PT after single dose of vitamin K were excluded.

Complaints of patients, findings at the examination, coulter blood count (CBC), biochemical tests, coagulation tests (PT, PTT, fibrinogen, coagulation factors) and results of

neuroimaging were evaluated. Place of birth, nutrition, protracted diarrhea, antibiotic usage, vit K administration at birth, disorders of the mother and drugs which were used by the mother were recorded.

Results

Fourteen cases included in the study were male (63.6%) and 8 were female (36.4%). Ages were ranged from 31 to 60 days (mean 45.32 ±10.37 days). All were full term babies. Twenty of the patients were born by normal vaginal delivery (90.9%) and two by cesarean section (9.1%). The number of the cases born at home was 12 (54.5%); the other 10 babies were born in hospital (45.5%). It was established that vit K was not given to any newborn and all were breast-fed only. None had protracted diarrhea or used antibiotics.

The major complaint at admittance was convulsion (63.6%), vomiting (59%) and irritability (45.4%). Lethargy and refusal to feed was present in 27.2% and 18.1% of the cases respectively (Table-I). Clinical signs and symptoms of the patients when they were admitted to hospital are shown in Table-II.

Cranial CT was performed on all cases. Subdural hemorrhage was the most frequent localization of the intracranial hemorrhage (86.3%). In addition, subarachnoid hemorrhage (SAH) and subdural hemorrhage with SAH were present in 27.2% and 13.6% of the cases, respectively (Table-III).

In light of the clinical and radiological signs, eight cases required surgery and the others were followed with supportive therapy. The patients were controlled for one-48 months (30.9514.41 months). Hydrocephalus occurred in only two cases (9%). Six of the patients (27.2%) had neurological problems such as epilepsy, mental retardation and hemiparesis. Two cases of hydrocephalus were operated successfully for ventriculoperitoneal shunt. Two patients died because of complications in the acute period.

Discussion

HDN is a rare disease with its high mortality and morbidity (6,7). It is one of the most frequent causes of intracranial hemorrhage in the first year of life. Bleeding occurs because of insufficient vit K dependent factors such as FII, FVII, FIX and FX activity. Generally, the presentation occurs after the first month of life. HDN is the major probability in a bleeding infant if PT-PTT is higher than

normal fibrinogen level and platelet count. If the bleeding stops and PT returns to normal after vit K supplementation, diagnosis is more accurate. Late HDN may be seen at any time between the 8th day and 12th month, but is more frequent at 4-8th weeks. It is generally presented with intracranial hemorrhage and widespread deep ecchymosis. In addition, gastrointestinal system and superficial skin hemorrhage are seen (3,8). Breast-fed infants and newborns with inadequate vit K prophylaxis are under the risk of hemorrhagic disease. The amount of vit K in mother's milk is not sufficient. HDN is more frequent in babies who are born at home (6,9,10). Nearly half of our patients were born at home, all were breast-fed and 4-8th weeks old.

Vit K deficiency can also occur due to secondary causes. Chronic diarrhea, cystic fibrosis, biliary atresia, Celiac disease, alpha 1-antitrypsin deficiency, abetalipoproteinemia and a history of warfarin usage for a long period may induce vit K deficiency (6,10). None of such pathologies were present in any cases of this study.

Intracranial hemorrhage risk of late HDN is reported as high as 50-80% (2). While subdural is the most common location for hemorrhage, subarachnoidal hemorrhage is the second most common type. Isarangkura (11) has reported the rate of subdural, subarachnoidal and intraparenchymal bleeding as 100%, 80% and 30%, respectively. In another report, Pooni et al. (3) reported subdural hemorrhage in 57.2%, and subarachnoidal hemorrhage in 46.4% of the patients in their study. In the present study, 86.3% of the cases had subdural, and 27.2% had subarachnoidal hemorrhage. Three cases had more than one localization of bleeding (13.6%).

Late HDN can be presented by convulsions, poor sucking, irritability and pallor. Hemorrhagees of gastrointestinal system, mucosal membranes and skin can accompany the disease. Intracranial hemorrhage is the major cause of morbidity and mortality. Mortality is reported as 14-50% by different authors (2,8,12). Most of the cases did not take vit K prophylaxis at birth. Administering vit K to every newborn can impede the disease, which has a high morbidity and mortality (8,10,13). Our mortality rate was 9%. Early admittance to hospital and rapid treatment of patients may be cause of this low mortality rate.

In the follow-up period (mean 30.95 ± 14.41 months), six cases had neurological disorders. All had epilepsy, four had mental retardation and four had hemiparesis. Hydrocephalus was diagnosed in only two cases and ventriculoperitoneal shunt was applied. Sequelae incidence is reported as 21% by Sutor et al. (12) and 36% by D'Souza et al. (10). Similarly, we found this ratio to be 27%.

As a result of all these data, vit K deficiency related hemorrhages remain still an important problem today. It is upsetting to see the disease in babies born in hospital as well as home births. Oral prophylaxis of vit K is preventive against early and classical hemorrhagic disease, but not for late HDN. Parenteral administration is necessary for this late disease, which has a higher morbidity and mortality (3,7,10,14). For this reason, medical personnel who deal with the newborn must be educated in this simple issue. In this way, it would be possible to decrease the rate of this important cause of newborn morbidity and mortality.

Table-I. Presenting symptoms of patients

Presenting symptoms	n	%
Convulsions	14	63.6
Vomiting	13	59.0
İrritability	10	45.4
Lethargy	6	27.2
Refusal to feed	4	18.1

Table-II: Findings of physical examination (symptoms) at the admittance

Features	n	%
ICP findings	11	50.0
Pyramidal findings	10	45.4
Conscious impairment	6	27.2
Hemiparesis	2	9.0
Hematoma on extremities	6	27.2
Mucosal hemorrhage	3	13.6

ICP: Increased intracranial pressure

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Table-III: Types of intracranial hemorrhages in the patients

Location	n	%
Subdural hemorrhage	19	86.3
SAH	6	27.2
Subdural hemorrhage +SAH	3	13.6

SAH: Subarachnoid hemorrhage