

Hemorrhagic Disease of The Newborn

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Abstract

The incidence of HDN in infants who do not receive prophylactic vitamin K in various countries is reported to vary. Researchers implement Midwifery Care for Neonates with Hemorrhagic Diseases of the Newborn (HDN) using the midwifery management mindset according to Varney and documenting care in the form of SOAP. The study used an observation method on a 4-day-old baby with a history of premature birth at 34-45 weeks of gestation and was born by Sectio Caesarea with indications of Placenta Previa Totalis. HDN in this case was classified as classic HDN because it occurred 4 days after birth and was followed by several symptoms such as bleeding from the digestive system and followed by prolonged PPT without any thrombocytopenia or other abnormalities on physical examination.

Keywords:

Hemorrhagic; Newborn.

Introduction

Hemorrhagic Disease of the Newborn (HDN) is a bleeding disease that occurs in the first days of life due to vitamin K deficiency which is characterized by decreased factors II, VII, IX, X. This term was first introduced by Townsend in 1894 which was defined as bleeding from various places in healthy infants without trauma, asphyxia, or spontaneous bleeding,¹ was first noticed by Dan in 1909 in chickens, while the relationship between vitamin K deficiency and HDN was first proposed by Brinkhous in 1937.²

The American Society of Pediatrics (AAP) in 1961 defined HDN as a bleeding disease that occurs in the first days of life caused by vitamin K deficiency and is characterized by a deficiency of prothrombin, proconvertin, and possibly other factors. This initial limit has changed to vitamin K dependent

¹ CHARLES W Townsend, "The Haemorrhagic Disease of the Newborn," *Arch Pediatr* 11 (1894): 559-65.

² P A Owren, "The Diagnostic and Prognostic Significance of Plasma Prothrombin and Factor V Levels in Parenchymatous Hepatitis and Obstructive Jaundice," *Scandinavian Journal of Clinical and Laboratory Investigation* 1, no. 2 (1949): 131-40.

bleeding (VKDB) / Bleeding due to Vitamin K Deficiency (PDVK), because at the initial limit there are still infants who experience bleeding from other factors.³

The incidence of HDN in infants who do not receive prophylactic vitamin K in various countries is reported to vary. Several studies have shown that the incidence of HDN is more common in infants who receive breast milk (ASI) than infants who receive formula milk. The clinical manifestations of HDN can be classified into three forms, namely: early, classic, and late forms. Bleeding manifestations are generally nonspecific and vary from bruising to mild to generalized ecchymosis, gastrointestinal bleeding and lethal intracranial hemorrhage. In this article, researchers implement Midwifery Care for Neonates with Hemorrhagic Diseases of the Newborn (HDN) using the midwifery management mindset according to Varney and documenting care in the form of SOAP.

Method

This study used an observation method on a 4-day-old baby with a history of premature birth at 34-45 weeks of gestation and was born by Sectio Caesarea with indications of Placenta Previa Totalis. Researchers are interested in conducting an in-depth investigation in this case because of the need for awareness for health workers to know the symptoms and treat it immediately because HDN is an intracranial hemorrhage that can be dangerous if it gets treatment too late.

Result and Discussion

Prenatal history shows that during this baby's pregnancy the mother routinely checked her pregnancy at the obstetrician 5 times and at the health facility once. This pregnancy is a planned pregnancy. This pregnancy is the second pregnancy after being married for 1 year and once miscarried. During pregnancy, the mother regularly took vitamins from the obstetrician and several times came out of blood spots until the gestational age of 34-35 weeks and was advised by the obstetrician to do Sectio Caesarea. Maternal pregnancy is a risky pregnancy because the mother has experienced an abortion before.

Pregnancy Diagnosis Gravida 2 Parity 1 Abortion 1 Gestational Age 34-35 weeks Single, Live, Intrauterine with Placenta Previa Totalis. During pregnancy, the mother never took antituberculosis or anticonvulsant drugs. Christmas

³ Silvia Iacobelli, Francesco Bonsante, and Pierre-Yves Robillard, "Comparison of Risk Factors and Perinatal Outcomes in Early Onset and Late Onset Preeclampsia: A Cohort Based Study in Reunion Island," *Journal of Reproductive Immunology* 123 (September 2017): 12-16, <https://doi.org/10.1016/j.jri.2017.08.005>.

history shows babies born prematurely by Sectio Caesarea on 25-02-2020 at 14.07 WIB, assisted by doctors, Apgar score 3-4, clear membranes. At birth the baby's movements and cries are weak and whimpering, cyanosis (-). Postnatal history showed that the newborn was 1480 grams, body length was 39 cm, head circumference was 25 cm, chest circumference was 26 cm, (-), caput succedaneum (-), retractions (+), anus (+).

Day/Time	Actions
Day 1 14.07	The baby was placed in an infant warmer and treated for newborns in the form of umbilical cord care, 1 mg Vit K injection, infant resuscitation, and 1 liter/minute of nasal O ₂ . Collaboration with Pediatricians and then getting NICU Transfer Advice.
14.30	The baby was transferred to the NICU, cyanotic baby, AS 5-6, deep retractions (+), moaning (+), cold akral, ballard score 32 weeks, SpO₂ 82%, HR : 160x/min, temperature 36 °C, GDA 102 g dL, carry out Pediatrician's advice: - Installing Neopuff : flow 8 L, PEEP 8, PIP 20, FiO₂ 100% - Installing infusion - Resuscitation of 15 cc of NaCl in 1 hour if CRT post loading NaCl 15 cc the second hour is still 4 seconds, give the third loading of NaCl 15 cc hours - D10% 90 cc/ 24 hours - Injection of Ampicillin 2 x 75 mg - Installing open OGT and fasting baby - Taking blood samples to check DL, CRP, GDA, blood culture - Photo thorax cito ged - Information Communication and Family Education about the baby's condition - Laboratory Results at 17.24 WIB: - Hemoglobin: 16.5 g/dL (13.2 – 17.3) - Leukocytes: 20,000 mm³ (9400-34000) - Hematocrit : 51.8% (44-72) - Platelets : 275,000 mm³ (180000-550000) - Blood type O - Rhesus : + - Quantitative CRP : 0.3 (< 5.0) - Hb : 16, 5 g/dL (13,2 – 17,3) - Leukosit : 20.000 /mm³ (9400-34000)

	Hematokrit : 51,8 % (44-72) Trombosit : 275.000 /mm ³ (180000- 550000) Golda : O Rhesus : + CRP Kuantitatif : 0,3 (< 5,0) - The results of the chest x-ray: baby thorax photo 1 position: no abnormalities
19.30	Report laboratory results, advice from Pediatricians: Neopuff FiO ₂ is reduced gradually if stable, replace CPAP if CRT post loading NaCl 15 cc to III persists, fluid therapy D10% 90 cc in 24 hours is continued.
Day 2 15.40	Installed CPAP, chest retraction (+), HR 139x/m, fasting (+), open OGT, CPAP FiO ₂ 40% PEEP 7 FLOW 8 Pediatrician's advice: - Fast - D10% 90 cc in 24 hours - Injection of Ampicillin 2 x 100 mg - CPAP FiO ₂ 40% PEEP 7 FLOW 8 - Ca gluconate 2 ml
Day 3 14.00	Spontaneous breathing with CPAP FiO ₂ 40% PEEP 7 FLOW 8, urination (+), defecation (-), pediatrician advice: - D10% 130 cc/ 24 hours - Injection of amikacin 2 x 50 mg - breast milk - Ca gluconate 2 ml/ 24 hours - Injection of Ampicillin 2 x 100 mg - Check the DL lab, Bilirubin, serum electrolytes Laboratory results on 27-02-2020 at 23.56 WIB Hb : 12.7 g/dL (13.2 – 17.3) Leukocytes : 6930 mm ³ (9400-34000) Platelet : 216.000 mm ³ (180000- 550000) Hematocrit : 35.2% (44-72) PPT : 11.8 c : 10.4 sec (9.3-11.4 sec) APTT : 35.4 c : 23.6 (duplo) (24.5 – 32.8 sec) Direct Bilirubin : 0.97mg/dL (< 0.3) Total Bilirubin : 15.11 (<7.0) Potassium : 2.9mmol/L (3.3 – 5.6) Sodium : 134 mmol/L (132-143) Chloride : 98 mmol/L (96-116)

Day 4 09.00	<u>Hematin residue 5 cc</u>, urination (+), defecation (-), HR 150x/m, RR 59x/m, SpO2 97%, advice from pediatricians: - Vitamin K injection 1 mg/ day for 3 consecutive days - Photo therapy 2 x 24 hours - D10% 150 cc/ 24 hours - Injection of amikacin 60 cc/ 24 hours - Moderate breast milk - Ca gluconate 2 ml - CPAP FiO2 30% PEEP 7 FLOW 8 - KCL 1 cc drip 6 hours - The 1st 1 mg vitamin K injection - Injection of Ampicillin 2 x 100 ml
- Day 5 - 07.00	Attached photo therapy, umbilical cord (+), defecation (-), urination (+), CPAP FiO2 30% PEEP 7 FLOW 8, shortness of breath (+), advice from pediatricians: - D10 0.18 NS 140 cc/24 hours - Injection of amikacin 2 x 60 mg - Moderate breast milk - Injection of Ampicillin 2 x 100 mg - Ca gluconate 2 ml - CPAP FiO2 25% FLOW 8 PEEP 7 - 2nd 1 mg vitamin K injection - KCL 1 mg drip 6 hours Laboratory results on 29-02-2020 at 22.32 WIB - Hb : 12.9 g/dL (13.2 – 17.3) - Leukocytes: 10,260 mm³ (9400-34000) - Platelets : 271,000 mm³ (180000-550000) - Hematocrit: 35.4% (44-72) - Direct bilirubin: 2.01 mg/dL (< 0.3) - Total Bilirubin : 8.54 mg/dL (<7.0) - Potassium : 3.2 mmol/L (3.3 – 5.6) - Sodium : 139 mmol/L (132-143) - Chloride : 103 mmol/L (96-116) - Quantitative CRP : 0.8 mg/ dL (< 5.0)
Day 6 08.00	Off therapy photos, umbilical cord (+), defecation (-), urination (+), CPAP FiO2 30% PEEP 7 FLOW 8, shortness of breath (+), advice from pediatricians: - D10 0.18 NS 140 cc/24 hours - Amikacin injection 2 x 60 mg

	- Moderate breast milk - Ampicillin Injection 2 x 100 mg - Ca gluconate 2 ml - CPAP FiO₂ 25% FLOW 8 PEEP 7 - KCL 1 mg drip 6 hours - 3rd injection of vitamin K 1 mg
Day 7 08.00	Monitoring Early Warning System and elimination with the results: HR : 130 x/m, RR : 74 x/m, Temperature : 37°C, SpO ₂ : 99%, no defecation, no urine; The results have been written on the observation sheet.
10.00	Monitoring Early Warning System and elimination with the results: HR : 133 x/m, RR : 85 x/m, Temperature : 37.6°C, SpO ₂ : 99%, no defecation, no urine; The results have been written on the observation sheet.
12.00	Monitoring Early Warning System and elimination with the results: HR : 135 x/m, RR : 85 x/m, Temperature : 37.4°C, SpO ₂ : 99%, no defecation, no urine; The results have been written on the observation sheet.
14.00	Doing weigh-in with the afternoon shift officer
Day 8 08.00	- Monitoring Early Warning System and elimination with the results: HR : 165 x/m, RR: 50 x/m, Temperature: 36.9°C, SpO₂: 99%, no defecation, urine 40 ml; The results have been written on the observation sheet and the diaper has been changed - Provide breast milk by using OGT in infants; 5 ml of breast milk has entered, there is no residue and the baby is not vomiting
10.00	- Monitoring Early Warning System and elimination with the results: HR : 162 x/m, RR : 49 x/m, Temperature : 37.0°C, SpO₂: 99%, no defecation, no urine; The results have been written on the observation sheet - Giving breast milk using OGT to the baby; 5 ml of breast milk has entered, there is no residue and the baby is not vomiting - Tidy up the baby's bedding; baby sleeps comfortably.
12.00	Monitoring Early Warning System and elimination with the results: HR : 137 x/m, RR : 62 x/m, Temperature : 37.2°C, SpO ₂ : 100%, no defecation, 45 ml urine; The results have been written on the observation sheet and the diaper has been changed.
14.00	Doing weigh-in with the afternoon shift officer.

Day 9 08.00	- Monitoring Early Warning System and elimination with the results: HR: 130 x/m, RR: 62 x/m, Temperature: 37.1°C, SpO2: 100%, yellow defecation, 50 ml urine; The results have been written on the observation sheet and the diaper has been changed. - Give 8 ml of breast milk; Breast milk has been given through the sonde, there is no residue and the baby is not vomiting.
10.00	- Monitoring Early Warning System and elimination with the results: HR : 138 x/m, RR : 65 x/m, Temperature : 37.1°C, SpO2 : 100%, no defecation, no urine; The results have been written on the observation sheet. - Give 8 ml of breast milk; Breast milk has been given through the sonde, there is no residue and the baby is not vomiting.
12.00	- Monitoring Early Warning System and elimination with the results: HR : 137 x/m, RR: 62 x/m, Temperature: 37.2°C, SpO2: 100%, no defecation, 40 ml urine; The results have been written on the observation sheet and the diaper has been changed - Give 8 ml of breast milk; Breast milk has been given through the sonde, there is no residue and the baby is not vomiting
14.00	Doing weigh-in with the afternoon shift officer
Day 10 22.00	- Monitoring Early Warning System and elimination with the results: HR : 134 x/m, RR : 46 x/m, Temperature : 37.1°C, SpO2 : 100%, no defecation, no urine; The results have been written on the observation sheet - Give 10 ml of breast milk; Breast milk has been given through a cup, there is no residue and the baby is not vomiting.
00.00	- Monitoring the Early Warning System and elimination with the results: HR : 132 x/m, RR : 61 x/m, Temperature : 37.1°C, SpO2 : 100%, yellow defecation, 43 ml urine; The results have been written on the observation sheet and the diaper has been changed - Give 15 ml of breast milk; Breast milk has been given through a cup, there is no residue and the baby is not vomiting - Continuing the administration of D10 0.18 NS as much as 65 ml using an infusion pump; smooth infusion, no swelling in the baby's hands and no allergic reactions

	- Administer 45 ml of 6% aminosteril via a syringe pump; smooth infusion, no swelling in the baby's hands and no allergic reactions.
02.00	- Monitoring the Early Warning System and elimination with the results: HR : 137 x/m, RR : 60 x/m, Temperature : 37.2°C, SpO2 : 100%, no defecation, no urine; The results have been written on the observation sheet - Give 15 ml of breast milk; Breast milk has been given through a cup, there is no residue and the baby is not vomiting.
04.00	- Monitoring the Early Warning System and elimination with the results: HR : 130 x/m, RR : 61 x/m, Temperature : 37.2°C, SpO2 : 100%, no defecation, 40 ml urine; The results have been written on the observation sheet and the diaper has been changed - Change the baby's bed linen; the linen has been changed and the baby is comfortable - Give 15 ml of breast milk; Breast milk has been given through the cup, there is no residue and the baby.
05.30	The baby vomits approximately 10 cc. cleaning up baby vomit and changing baby bed linen.
06.00	- Monitoring the Early Warning System and elimination with the results: HR : 130 x/m, RR : 61 x/m, Temperature : 37.2°C, SpO2 : 100%, no defecation, no urine; The results have been written on the observation sheet - Give 15 ml of breast milk; Breast milk has been given through a cup, there is no residue and the baby is not vomiting - Doing weighing using baby bloom; Weight now 1450 grams
07.00	Doing weigh-in with the morning shift officer
Day 11 16.00	- Monitoring the Early Warning System and elimination with the results: HR : 146 x/m, RR : 50 x/m, Temperature : 36.9°C, SpO2: 99%, no defecation, urine 40 ml; The results have been written on the observation sheet and the diaper has been changed - Wiping the baby with warm water. - Facilitate mothers to give breast milk directly to their babies (Putting) the baby is confused with the nipple. - Giving breast milk using a cup to the baby; 10 ml of breast milk has come in, there is no residue and the baby is not vomiting.
16.45	Teach mother to do the kangaroo method. Mom is ready and feeling very happy

18.00	- Monitoring the Early Warning System and elimination with the results: HR : 144 x/m, RR : 49 x/m, Temperature : 37.0°C, SpO2: 99%, no defecation, no urine; The results have been written on the observation sheet - Giving breast milk using a cup to the baby; 15 ml of breast milk has come in, there is no residue and the baby is not vomiting - Tidy up the baby's bedding; baby sleeps comfortably.
20.00	- Monitoring the Early Warning System and elimination with the results: HR : 137 x/m, RR : 48 x/m, Temperature : 37.2°C, SpO2 : 100%, no defecation, 45 ml urine; The results have been written on the observation sheet and the diaper has been changed - Giving breast milk using a cup to the baby; 15 ml of breast milk has come in, there is no residue and the baby is not vomiting.
20.30	The baby vomits approximately 10 cc. cleaning up baby vomit and changing baby bed linen.
21.00	Doing weigh-in with the night shift clerk
Day 12 16.00	- Monitoring the Early Warning System and elimination with the results: HR : 150 x/m, RR : 50 x/m, Temperature : 36.9°C, SpO2: 99%, no defecation, urine 40 ml; The results have been written on the observation sheet and the diaper has been changed - Wiping the baby with warm water. - Facilitating mothers to give breast milk directly to their babies (Putting). Baby confused with nipple. - Giving breast milk using a cup to the baby; 15 ml of breast milk has come in, there is no residue and the baby is not vomiting.
16.45	Facilitate mothers to do the kangaroo method. Mom is ready and feeling very happy.
18.00	- Monitoring the Early Warning System and elimination with the results: HR : 152 x/m, RR : 49 x/m, Temperature : 37.0°C, SpO2: 99%, no defecation, no urine; The results have been written on the observation sheet - Facilitate mothers to give breast milk directly to their babies (sucking). Suction reflex is lacking. - Giving breast milk using a cup to the baby; 20 ml of breast milk has come in, there is no residue and the baby is not vomiting - Tidy up the baby's bedding; baby sleeps comfortably.
20.00	Monitoring the Early Warning System and elimination with the results: HR : 137 x/m, RR : 62 x/m, Temperature : 37.2°C, SpO2 :

	100%, no defecation, 45 ml urine; The results have been written on the observation sheet and the diaper has been changed.
21.00	Doing weigh-in with the night shift clerk
Day 13 08.00	- Monitoring the Early Warning System and elimination with the results: HR : 135 x/m, RR : 42 x/m, Temperature : 36.9°C, SpO2: 99%, no defecation, 35 ml urine; The results have been written on the observation sheet and the diaper has been changed - Giving breast milk using a cup to the baby; 20 ml of breast milk has come in, there is no residue and the baby is not vomiting
10.00	- Facilitate mothers to give breast milk directly to their babies (sucking). The baby's sucking reflex is lacking. - Facilitate mothers to do the kangaroo method. Mother is willing and already memorized how to use cloth for the kangaroo method.
12.00	- Monitoring the Early Warning System and elimination with the results: HR : 138 x/m, RR : 49 x/m, Temperature : 37.0°C, SpO2: 99%, no defecation, no urine; The results have been written on the observation sheet - Facilitating Breastfeeding by using a cup for babies; 18 ml of breast milk has come in, there is no residue and the baby is not vomiting - Tidy up the baby's bedding; baby sleeps comfortably.
13.00	Facilitate mothers to do the kangaroo method. Mother is ready and already understands how to use
14.00	Monitoring the Early Warning System and elimination with the results: HR : 135 x/m, RR : 62 x/m, Temperature : 37.3°C, SpO2 : 100%, no defecation, 45 ml urine; The results have been written on the observation sheet and the diaper has been changed.
14.00	Doing weigh-in with the night shift clerk
Day 14 08.00	- Monitoring the Early Warning System and elimination with the results: HR : 135 x/m, RR : 42 x/m, Temperature : 36.9°C, SpO2: 99%, no defecation, 35 ml urine; The results have been written on the observation sheet and the diaper has been changed - Giving breast milk using a cup to the baby; 20 ml of breast milk has come in, there is no residue and the baby is not vomiting.
10.00	- Facilitate mothers to do the kangaroo method. Mother is ready and already understands how to use - Providing Information Communication and Education.

Before making a diagnosis, a history and several examinations are carried out. After anamnesis, it is known that the baby was born prematurely to a primigravida mother with a gestational age of 34/35 weeks and weighs 1480 grams. At the beginning of the birth, the baby was fasted because of respiratory distress, so the baby was transferred to the NICU. Immediately after birth the baby was given an IM injection of 0.5 mg of vitamin K. Newborns have low levels of vitamin K associated with limited placental transfer after the umbilical cord is cut.⁴

Vitamin K levels in the baby's umbilical cord are so low compared to adults that the American Academic of Pediatrics recommends giving vitamin K 0.5-1 mg intramuscularly to prevent bleeding in newborns due to vitamin K deficiency.⁵ The recommendation from the Canadian Pediatrics Society (CPS) regarding prophylactic vitamin K administration after birth is 0.5-1 mg IM followed by a dose of 2 mg vitamin K orally within 6 hours of birth and then the oral dose is phased out at 2-4 weeks and 6 weeks of age. -8 weeks.⁶

Haemorrhagic Disease of Neonatal (HDN) often occurs in the neonatal period caused by several factors such as vitamin K deficiency,⁷ Disseminated Intravascular Coagulation (DIC), platelet function abnormalities, trauma, to liver disorders. HDN is bleeding that occurs spontaneously in neonates and is mostly caused by vitamin K deficiency. Lower coagulation factors or about 20-50% of adults, chronic diarrhea, breastfed infants, and prolonged use of antibiotics increase the risk of vitamin K deficiency. If you look at the results of laboratory tests, it shows that there is a prolongation of the PTT time but there is no disturbance in the platelets. Symptoms caused when HDN is caused by DIC are lethargy, hypotonic, tachycardia, tachypnea and CRT > 3 seconds but these symptoms were not found in this case.⁸

Vitamin K is an important component for -carboxylation of residual glutamic acid which is used to coagulate factors II, VII, IX and X. Premature

⁴ Michael Warren et al., "Late Vitamin K Deficiency Bleeding in Infants Whose Parents Declined Vitamin K Prophylaxis—Tennessee, 2013," *MMWR. Morbidity and Mortality Weekly Report* 62, no. 45 (2013): 901.

⁵ Nihat Demir et al., "Massive Gastrointestinal Bleeding Due to Vitamin K Deficiency in a Newborn," *Eastern Journal of Medicine* 20, no. 4 (2015): 238.

⁶ Eugene Ng and Amanda D Loewy, "Guidelines for Vitamin K Prophylaxis in Newborns," *Paediatrics & Child Health* 23, no. 6 (2018): 394–97.

⁷ Lauren H. Marcewicz et al., "Parental Refusal of Vitamin K and Neonatal Preventive Services: A Need for Surveillance," *Maternal and Child Health Journal* 21, no. 5 (May 4, 2017): 1079–84, <https://doi.org/10.1007/s10995-016-2205-8>.

⁸ Brahim El Hasbaoui, Lamia Karboubi, and Badr Sououd Benjelloun, "Newborn Haemorrhagic Disorders: About 30 Cases," *Pan African Medical Journal* 28, no. 1 (2017): 123.

infants have a higher risk of developing HDN due to factor II and low vitamin K reserves. N was born prematurely with RDS and was given intensive care in the NICU. Babies are fasted on the first day for several reasons, but on the third day they are given breast milk through a feeding tube / OGT (Oral Gastric Tube). One day later when the baby was four days old, there was a black residue of 5 cc of OGT. So in this case premature and breastfeeding are risk factors for HDN due to vitamin K deficiency.

Vitamin K is a type of fat-soluble vitamins such as vitamin K1 (phylloquinone) and K2 (menaquinone). Vitamin K1 is mostly obtained from food sources such as broccoli, spinach and cabbage. After being metabolized by the body, only a small amount of vitamin K is found in breast milk, while the vitamin K content in formula milk can be up to 50% more than the levels stated on the packaging. Overall, it can be seen that formula-fed babies rarely develop HDN, but that does not mean that formula-fed babies are better off than breastfed babies.

Newborns are at risk of Haemorrhagic Disease of the Newborn (HDN) which is divided into early HDN, classic HDN and late HDN. Early HDN occurs within 24 hours of birth which can be caused by taking anticonvulsant and antituberculosis drugs during pregnancy. Antituberculosis drugs such as niazinamide and rifampin can interfere with the oxidation process of vitamin K thereby increasing the risk of HDN while anticonvulsant drugs can destroy vitamin K present in microsomal enzymes in the liver.⁹ In this case the mother had never taken drugs that could reduce vitamin K in the fetus so that HDN did not occur in the first 24 hours of birth. Classic HDN occurs at 2-7 days of birth associated with low vitamin K stores and breastfeeding. This supports the diagnosis that occurs in infants, namely classic HDN because the baby does not show intracranial bleeding which is one of the manifestations of late HDN (occurring 8 days-6 months of birth) due to not being given prophylactic vitamin K at birth.¹⁰

The classic HDN that occurred in this case was shown by the manifestation of a black residue from the OGT insertion syringe where this residue could come from the digestive tract. Infants received vitamin K after birth and were breastfed followed by 3 days of antibiotics without any chronic diarrhea before residues appeared. On physical examination, no abnormalities such as hepatosplenomegaly were found. Laboratory results showed PTT prolongation

⁹ Yujiao Lai et al., "Role of Vitamin K in Intestinal Health," *Frontiers in Immunology*, 2021, 5491.

¹⁰ M J Sankar et al., "Vitamin K Prophylaxis for Prevention of Vitamin K Deficiency Bleeding: A Systematic Review," *Journal of Perinatology* 36, no. 1 (2016): S29-35.

without thrombocytopenia and no intracranial bleeding. Classic HDN occurs in the gastrointestinal tract, nose and skin occurring on days 2-5 of birth.

There are sources that say that babies with classic HDN should be managed by giving formula milk because of its high vitamin K content. In this case, there was a difference where the baby was still breastfed but supported by intramuscular administration of vitamin K for three days, IM administration of vitamin K is more effective than oral. In addition to providing vitamin K, enteral nutrition is also needed, such as giving milk to babies. Formula milk contains 60 g/L of vitamin K, while breast milk only contains 15 g/L. Parenteral nutrition such as infusion of 10-15 mL/kg of fresh frozen plasma has a direct effect within 2 hours to balance hemostasis in cases of classic HDN.¹¹ After treatment, the bleeding stopped within 2 days and vitamin K injection was continued on the third day.

Basically, the baby's condition is starting to stabilize, but the parents are not brave and not skilled in caring for the baby, so the mother is taught to take care of the baby such as PMK (Kangaroo Method Care) so that when the mother is really sure that she can take care of her baby, and the baby can be sent home.

Conclusion

HDN is classified according to its onset and symptoms. HDN in this case was classified as classic HDN because it occurred 4 days after birth and was followed by several symptoms such as bleeding from the digestive system and followed by prolonged PPT without any thrombocytopenia or other abnormalities on physical examination. Treatment is done by giving vitamin K 1 mg via IM for 2 days can stop the bleeding so that treatment is carried out until the baby's condition is more stable.

References

- Demir, Nihat, Erdal Peker, Kaan Demirören, Sultan Kaba, and Oguz Tuncer. "Massive Gastrointestinal Bleeding Due to Vitamin K Deficiency in a Newborn." *Eastern Journal of Medicine* 20, no. 4 (2015): 238.
- Hasbaoui, Brahim El, Lamia Karboubi, and Badr Sououd Benjelloun. "Newborn Haemorrhagic Disorders: About 30 Cases." *Pan African Medical Journal* 28, no. 1 (2017): 123.
- Iacobelli, Silvia, Francesco Bonsante, and Pierre-Yves Robillard. "Comparison of Risk Factors and Perinatal Outcomes in Early Onset and Late Onset Preeclampsia: A Cohort Based Study in Reunion Island." *Journal of Reproductive Immunology* 123 (September 2017): 12–16. <https://doi.org/10.1016/j.jri.2017.08.005>.

¹¹ M C A Müller et al., "Fresh Frozen Plasma Transfusion Fails to Influence the Hemostatic Balance in Critically Ill Patients with a Coagulopathy," *Journal of Thrombosis and Haemostasis* 13, no. 6 (2015): 989–97.

- Lai, Yujiao, Hori Masatoshi, Yanbo Ma, Yuming Guo, and Bingkun Zhang. "Role of Vitamin K in Intestinal Health." *Frontiers in Immunology*, 2021, 5491.
- Marcewicz, Lauren H., Joshua Clayton, Matthew Maenner, Erika Odom, Ekwutosi Okoroh, Deborah Christensen, Alyson Goodman, et al. "Parental Refusal of Vitamin K and Neonatal Preventive Services: A Need for Surveillance." *Maternal and Child Health Journal* 21, no. 5 (May 4, 2017): 1079–84.
<https://doi.org/10.1007/s10995-016-2205-8>.
- Müller, M C A, M Straat, J C M Meijers, J H Klinkspoor, E De Jonge, M S Arbous, M J Schultz, M B Vroom, and N P Juffermans. "Fresh Frozen Plasma Transfusion Fails to Influence the Hemostatic Balance in Critically Ill Patients with a Coagulopathy." *Journal of Thrombosis and Haemostasis* 13, no. 6 (2015): 989–97.
- Ng, Eugene, and Amanda D Loewy. "Guidelines for Vitamin K Prophylaxis in Newborns." *Paediatrics & Child Health* 23, no. 6 (2018): 394–97.
- Owren, P A. "The Diagnostic and Prognostic Significance of Plasma Prothrombin and Factor V Levels in Parenchymatous Hepatitis and Obstructive Jaundice." *Scandinavian Journal of Clinical and Laboratory Investigation* 1, no. 2 (1949): 131–40.
- Sankar, M J, A Chandrasekaran, P Kumar, A Thukral, R Agarwal, and V K Paul. "Vitamin K Prophylaxis for Prevention of Vitamin K Deficiency Bleeding: A Systematic Review." *Journal of Perinatology* 36, no. 1 (2016): S29–35.
- Townsend, CHARLES W. "The Haemorrhagic Disease of the Newborn." *Arch Pediatr* 11 (1894): 559–65.
- Warren, Michael, Angela Miller, Julie Traylor, Robert Sidonio, Anna Morad, Alyson Goodman, Deborah Christensen, Althea Grant, Erika Odom, and Ekwutosi Okoroh. "Late Vitamin K Deficiency Bleeding in Infants Whose Parents Declined Vitamin K Prophylaxis—Tennessee, 2013." *MMWR. Morbidity and Mortality Weekly Report* 62, no. 45 (2013): 901.