International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 04 Issue 04 April 2024

Page No: 264-267

DOI: https://doi.org/10.47191/ijpbms/v4-i4-02, Impact Factor: 7.792

Management of Neonatal Jaundice during Initial Health Care Visit

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ABSTRACT

Backgrounds: Cholestasis is a bile flow disorder resulting in liver bile retention. It is characterized by intrahepatic (IH) and extrahepatic (EH) cholestasis. Health workers are strategically placed to provide correct information in managing patients with cholestasis. This study aimed to assess the management of neonatal jaundice during initial health care visit.
Methods: A cross-sectional study was conducted on infants with cholestasis treated at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. Questionnaires as data collection instruments were used. Statistical analysis was performed using Pearson's chi-square test.
Results: Subjects consisted of 40 (58%) infants boys, 29 (42%) infants girls, IH cholestasis were 28 (41%), and EH cholestasis were 41 (59%). In both groups, most infants with cholestasis sought medical care between 0 and 1 month. Health workers stated that most subjects were underfed, as indicated by the 14 (20%) intrahepatic and 26 (38%) extrahepatic subjects. In this study, most infants with cholestasis were advised to get sun exposure. Sun exposure began at birth in 21 (30%) intrahepatic and 36 (52%) extrahepatic subjects. There were no significant differences based on underfeeding and sun exposure between the intrahepatic and extrahepatic cholestasis groups ($p=0.268$; $p = 0.168$).
Conclusion: The management of neonatal jaundice among health workers regarding breastfeeding and sun exposure recommendations did not significantly differ between intrahepatic and extrahepatic cholestasis. Health workers require more knowledge about cholestasis infant management. Correct understanding improves cholestasis infants' outcomes.

KEYWORDS: Cholestasis, intrahepatic, extrahepatic, management, health workers

ARTICLE DETAILS

Published On:
01 April 2024

Available on:
https://ijpbms.com/

I. INTRODUCTION

High levels of bilirubin cause the skin and sclera of newborns to become yellowish, a condition known as neonatal physiological jaundice In the first week following birth, 60% of term and 80% of preterm newborns acquire clinical jaundice (Aljazaeri, 2021). It is usually mild and self-limiting (Ansong-Assoku et al., 2023). Jaundice is considered pathological if it starts within 24 hours of birth and the baby's serum bilirubin level continues to grow, known as Neonatal Cholestasis (NC) (Ghazy and Khedr, 2019).

Cholestatic jaundice is invariably pathologic and implies hepatobiliary dysfunction. About 1 in 2,500 term newborns have it. Biliary atresia (25%–40%) is the most common cause of cholestatic jaundice in the first months of life, followed by an expanding list of monogenic disorders (25%) and many unknown or multifactorial causes, each requiring immediate and distinct management plans (Fawaz et al., 2017).

After confirming NC, a systematic approach is needed to diagnose and start life-saving treatment reliably (Götze et al., 2015). Unfortunately, identifying neonates with cholestatic jaundice is challenging because it resembles the physiological jaundice prevalent in early infancy (American Academy of Pediatrics, 2018). Late referral of babies with cholestatic jaundice is often due to inadequate neonatal jaundice follow-up or primary care physicians' reassurances that it is normal (Benchimol et al., 2009). This study analyses the management of neonatal jaundice among health workers during initial healthcare visits.

II. MATERIAL AND METHOD

A. Study Design

A cross-sectional study was conducted on infants aged > 2 weeks with cholestasis treated at Dr. Soetomo General Academic Hospital in Surabaya, Indonesia, from October 2022 to September 2023. Diagnostic criteria for cholestasis include persistent jaundice and conjugated bilirubin levels > 1 mg/dl if total bilirubin < 5 mg/dl or > 20% if total bilirubin > 5 mg/dl. A questionnaire was given to parents to determine what therapies and management were given to their infants during the initial healthcare visit. Patients were categorized by percutaneous liver biopsy results. This study was carried out after receiving ethical approval from the Dr. Soetomo General Academic Hospital's ethics committee in Surabaya, Indonesia.

B. Data Analysis

Statistical analysis was done using Windows SPSS (25.0). Pearson's chi-square test was performed to analyze the differences between categorical data sets.

III. RESULT

In this study, there were 69 infants with cholestasis, consisting of 41 infants with extrahepatic and 28 infants with intrahepatic cholestasis. The participants' sex, age of presentation (months), jaundice onset, and nutrition status are described. Based on Table 1, the majority of subjects were male (58%), aged 0-1 month (43%), jaundice onset <2 weeks (29%) and age range 1-2 months (29%), and not malnourished.60 (87%).

Table 1. Characteristics of Intrahepatic and Extrahepatic Cholestasis Subjects

Variable	Cholestasis		Total (69)	P value
	EH n = 41 (59%)	IH n = 28 (41%)		
Sex				
Male	21	19	40 (58%)	0.169*
Female	20	9	29 (42%)	
Age (months)				
0-1	17	13	30 (43%)	0.888*
>1-2	13	9	22 (31%)	
>2-3	6	5	11 (16%)	
>3-4	1	0	1 (2%)	
>4-5	2	1	3 (4%)	
>5-6	1	0	1 (2%)	
>6	1	0	1 (2%)	
Onset of jaundice (weeks)				
< 2	11	9	20 (29%)	0.717*
≥ 2	8	6	14 (20%)	
4-8	14	6	20 (29%)	
> 8	8	7	15 (22%)	
Malnutrition				
Yes	6	3	9 (13%)	0.635*
No	35	25	60 (87%)	

Health workers stated that most subjects with jaundice were underfed during the initial visit, as indicated by 14 (20%) intrahepatic and 26 (38%) extrahepatic. Most infants with cholestasis were advised to get sun exposure. In this study, sun exposure began at birth in 21 (30%) intrahepatic and 36 (52%) extrahepatic subjects. There were no significant differences based on underfeeding and sun exposure between the intrahepatic and extrahepatic cholestasis groups (p=0.268; p = 0.168; Table 2)

Table 2. Differences in Subjects Stated as Underfed and Should be Sun Exposed Based on Health Workers Advise between Intrahepatic and Extrahepatic Groups.

Variable	Cholestasis		Total (69)	P value
	EH n = 41 (59%)	IH n = 28 (41%)		
Underfed				
Yes	26	14	40 (58%)	0.268*
No	15	14	29 (42%)	
Newborn Sun Exposure				
Yes	36	21	57 (83%)	0.168*
No	5	7	12 (17%)	

IV. DISCUSSION

Neonatal physiological jaundice is usually mild and lasts less than two weeks. The clinical manifestation of neonatal jaundice or hyperbilirubinemia is yellowish skin coloring, sclera, and mucous membrane caused by high total serum bilirubin (TSB) (Ansong-Assoku et al., 2023). Known as "physiological jaundice," it is usually mild, transitory, and self-limiting and resolves without treatment. However, it may interfere with diagnosing a pathological condition called neonatal cholestasis (NC). The latter is a critical, uncommon problem defined by conjugated hyperbilirubinemia (Ghazy and Khedr, 2019).

Neonatal cholestasis can be caused by hepatocyte dysfunction in bile secretion or bile excretory pathway blockage. Depending on the level of obstruction to bile flow, cholestasis can be divided into intrahepatic or extrahepatic cholestasis (Shah and John, 2023). Intrahepatic or functional

cholestasis can be caused by liver parenchymal cell or bile duct disease. An obstruction of the bile ducts outside the liver causes extrahepatic or obstructive cholestasis. A liver biopsy is helpful for various possible underlying causes (Mandelia et al., 2017).

The most common causes of NC are biliary atresia (BA) and idiopathic newborn hepatitis (INH).10 Biliary atresia is the most prevalent cause of end-stage liver disease in children and the main reason for liver transplantation in children. The challenge remains for clinicians. Early diagnosis of BA improves management and prognosis (Götze et al., 2015; Fawaz et al., 2017; American Academy of Pediatrics, 2018).

In our study, most infants with intrahepatic or extrahepatic cholestasis sought medical care between 0 and 1 month. Clinical practice guidelines recommend that infants with prolonged jaundice (more than two weeks after delivery) should have bilirubin serum tested. The Committee recommends that any infants jaundiced after two weeks should be checked for cholestasis by measuring their total and direct serum bilirubin levels. If the direct bilirubin level is high (>1.0 mg/dl or >17 µmol/L), they need to be evaluated promptly by a pediatric gastroenterologist or hepatologist for further evaluation.4 Any jaundiced infant with acholic feces and elevated serum-conjugated bilirubin should be evaluated for BA. They must constantly be investigated because early diagnosis is crucial for treatment (American Academy of Pediatrics, 2018).

Based on parent's perceptions in this study, health workers stated that most subjects were underfed, as indicated by 14 (20%) intrahepatic subjects and 26 (38%) extrahepatic subjects. Most infants with cholestasis were advised to get sun exposure. In this study, sun exposure was started from birth in 21 (30%) intrahepatic subjects and 36 (52%) extrahepatic subjects. This was also the case in the previous study, which showed that primary healthcare providers stated that newborns with prolonged jaundice did not require further examination; they would improve on their own with continued breastfeeding and sun exposure (Setyoboedi et al., 2022).

Nearly 50% of newborns have jaundice, making a diagnosis other than physiologic or breast milk jaundice challenging (Zagory et al., 2015). Due to the difficulty distinguishing between physiologic and pathologic jaundice and the fact that exposure to UV light improves physiologic jaundice, neonates with pathologic jaundice are frequently exposed to sunlight for weeks to months, even if there is no improvement. If parents don't know, the diagnosis delay is a patient delay. In other cases, parents may have been more suspicious and brought their child to the nearest medical center for evaluation. However, due to the medical staff's ignorance, the baby might not receive the appropriate attention and prompt referral. It's known as a doctor's delay. Therefore, A high suspicion index is essential for an early diagnosis (Wildhaber, 2012). Misdiagnosis of cholestasis as physiologic jaundice delays severe liver disease detection. A detailed history and physical examination can diagnose the underlying condition decisively in a stepwise diagnostic strategy (Ghazy and Khedr, 2019).

CONCLUSIONS

There are still misdiagnoses of cholestasis as physiologic jaundice, which might delay detecting severe liver conditions. The management of neonatal jaundice among health workers regarding breastfeeding and sun exposure recommendations did not significantly differ between intrahepatic and extrahepatic cholestasis. Health workers require more knowledge about cholestasis infant management. Correct understanding improves cholestasis infants' outcomes.

ACKNOWLEDGMENT

We would like to convey our gratitude to the medical staff at Dr. Soetomo General Academic Hospital, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. No conflict of interest was declared. There is no conflict of interest.

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