SHORT COMMUNICATION

Clinical Features and Favorable Outcomes of Neonatal Jaundice in Full Term Newborn following intensive Phototherapy at a Tertiary care hospital in Yaoundé, Cameroon.

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ABSTRACT

Objective: to analyze the clinical and immediate outcome of neonatal jaundice in full term newborn (FTNB) after intensive phototherapy (IP).
Method: cross-sectional descriptive study from June 2016 to May 2017 in FTNB admitted for jaundice. All eligible patients treated with intensive phototherapy. Main measures: clinical and biological outcome.
Results:71 FTNB babies were included, prevalence rate at 9.7%. Median post-natal age at admission:3.6 days. Median level of total serum bilirubin varies from 21mg/dl with 15.4% > 25mg/dl to 8.4mg/dl after intensive phototherapy equalling 30% reduction. ABO incompatibility (56.6%) was the main etiology.
Conclusion : Hospital incidence of severe jaundice remains high in Yaoundé. IP ends with favorable outcomes in most cases.

INTRODUCTION

Neonatal jaundice is a yellowish coloring of the skin and mucosa membranes in a newborn. Its incidence in the world varies depending on race, breastfeeding rates, child maturity, and remains high in low- and middle-income countries [1]. In most sub-Saharan African countries' guidelines for effective management of hyperbilirubinemia especially severe cases (serum bilirubin ≥ 200mg/l) are lacking [2]. Unfortunately, the outcome of severe hyperbilirubinemia seems worse in low and middle-incomes countries notably morbidity, mortality and neurologic sequelae. Of note, neonatal jaundice is associated with the

occurrence of childhood deafness in 6.5% of cases and cerebral palsy in 2.8% of cases [2,3]. It is well known that phototherapy can help to alleviate harmful effects of hyperbilirubinemia. Furthermore, intensive phototherapy, stands currently as the gold standard treatment in case of newborn condition of hemolytic jaundice and help to avoid blood –transfusion exchange [4]. In Cameroon, a high country rated in newborn deaths, the features of neonatal jaundice has been shortly reported. We therefore decided to conduct a study in Yaoundé with the general objective of analyzing the epidemiological, clinical and immediate outcome of neonatal jaundice in full term newborn infants in the Essos's Hospital.

METHOD - STUDY POPULATION, SITE AND PROCEDURES

This was a cross-sectional descriptive study over a 12-month period starting on June 1, 2016, and ending on May 31, 2017. Our target population was full-term newborn hospitalised in neonatology unit of Essos hospital; infants admitted for neonatal jaundice were included and were excluded those with unusable records.The data sought were hospital incidence, maternal sociodemographic data (age, obstetric history..), associated maternal conditions, newborns' characteristics (sex, diagnosis and age), signs associated with jaundice, severity and probable etiology, modalities of hospital care, and clinical outcome up to the discharge. Causes of jaundice were assessed by identification of both maternal and babies blood group, ABO and rhesus, full blood count, urine culture, blood culture, Creative protein. These data were collected using a data sheet and were analyzed using the epidata software version 3.1.

RESULTS

Population 'characteristics

Overall 71 full term newborn babies were included during the period giving a facility based prevalence rate of 9.7% in this unit. In 25% cases, the jaundice had appeared prior to 48 hours of life, with a median age at admission 3.6 days of life. Male newborns were the most frequent with a sex ratio of 1,98. 92% of the newborn were born after vaginal deliveries and 87% were exclusively breastfed. The average maternal age of mothers was 30, with 79% of mother's multigravida. The signs associated with jaundice were a fever (23.66%), signs of

haemolysis (pallor in 16.90% of cases) and neurological signs of acute bilirubin encephalopathy (12.68%), **Caput succedaneum or cephalohematoma** was recorded only in three cases(4.2%).

Profile of hyperbilirubinemia and etiology of neonatal jaundice

On admission the median level of serum hyperbilirubinemia was 210 mg/l while median level of unconjugated bilirubinemia stood at 180mg/l, with 15.4% above 250mg/l; the median level of hemoglobin was 13.7g/100ml interquartile range[12.3-15.9] (table1). In all cases, the babies were treated with intensive phototherapy except one case which requires exsanguinotransfusion exchange. In addition, 16% children received blood transfusion due to anemia and almost 39% received antibiotics (table 2). The most presumptive etiology was ABO incompatibility (56.64%), followed by presumptive neonatal infection (40.85%, only 9 (12%) cases of proven neonatal infections through blood or urine culture). A significant link was found between the newborns of blood group B born from mothers of blood group O and the appearance of neonatal jaundice (p=0.02).

Table 1: Biological characteristics of babies upon admission

	Q1	**Médiane**	**Q3**
Total serum bilirubin in mg/l	134	210	244,5
Free serum bilirubin in mg/l	114	180	225,5
Conjugated bilirubin in mg/l	9	15	20
White blood cell (n/ dl)	9,5	13,5	20,3
Hemoglobine	12,3	13,5	15,9
Platelets	208	262	344

Table 2 Treatment and global management of neonatal jaundice at Essos hospital centre

Treatment and characteristics	N	%

Duration of phototherapy	From 1 to 2 sequences	46	66,67
	Above 2 sequences	23	33,33
Total		**69**	**100**
Blood transfusion	Yes	12	16,90
	No	59	83,10
Total		**71**	**100**
Blood transfusion exchange	Yes	1	1,41
	No	70	98,59
Total		**71**	**100**
Antibiotics	Yes	28	39,44
	No	43	60,56
Total		**71**	**100**
Phenobarbital	Yes	3	4,23
	No	68	95,77
Total		**71**	**100**

Management and Response to intensive phototherapy

After intensive phototherapy, the median level of total serum bilirubin and unconjugated serum bilirubin felt respectively at 84mg/l and 72.mg/l which represents a reduction of almost 40% compared to baseline. The clinical evolution under treatment was favorable in 99% of the cases after a median duration of hospitalization of 5 days. One death was recorded as consequence of a neonatal sepsis and no cases of kernicterus was recorded.

DISCUSSION

This study confirms the importance of neonatal jaundice in our context, as almost 1/10 newborn can develop this condition at facility level. Overall, our hospital incidence of jaundice in newborn fits between the 17% rate earlier posted in Cameroon and 4.9% rate found in Congo[5]. Comparatively with previous data, this study, posts a significant rate of severe

forms of jaundice requiring aggressive phototherapy. In fact, almost 1 among 3 newborn had dangerous level of hyperbilirubinemia, according to WHO guidelines[4]. The main etiology found in our context was ABO incompatibility which is concordant with observations done in Africa and Asia [3,6]. In fact, ABO incompatibility group is a growing issue, since the enlarged prevention of Rh blood incompatibility has been widely promoted. The ABO blood incompatibility however can sometimes be associated to other conditions as infections and is not constantly proven. We acknowledge than the role of neonatal infection in newborn jaundice, is quite high in low and middle resources settings and our rate of proven infection including blood or urine culture doesn't contradict recent findings of the prevalence of urinary tract infections among newborn affected by neonatal jaundice [7]. We record a high rate of early jaundice during the 48 hours of life; This feature is just confirming the severity of newborn jaundice in our context [2] and emphasizes the need of prevention and the requirement to delay discharge after birth [8] . Again, we want to emphazise the radical benefit of intensive phototherapy in reducing total serum bilirubinemia, in severe jaundice cases resulting in the scarce need of blood transfusion exchange [4]. We acknowledge the limitations of this study in authentication of etiology of jaundice.For instance; as systematic screening for of G6PD deficiency and other genetic and hemolytic conditions was lacking [9]. We would also deplore that due to budget restriction, late rebound of serum bilirubin could not be monitored thus limiting the analysis of the outcome after intensive phototherapy[10]; At last, the moment of discharge hampers us to monitored the frequency of jaundice caused by breastfeeding.

Conclusion and recommendations :

The incidence of jaundice is high (9.7%) with a significant rate of severe hyperbilirubinemia. The most common cause in our settings appears to be ABO incompatibility (56.64%). The male sex and maternal blood group O were the main risk factors for neonatal jaundice. The clinical course was favorable in 99% of the cases after intensive phototherapy.

We therefore recommend to use this data to raise awareness on the necessity to delay discharge of all newborn babies after 48 hours of life . In addition special attention should be addressed to babies born to mothers of Blood group O+. At last, based on the findings of this study with effective reduction in blood exchange transfusion, we plead for and extended access to intensive phototherapy, especially in all facility at tertiary care.

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AVAILABILITY OF DATA AND MATERIALS : The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

AUTHORS'S CONTRIBUTIONS: all authors contributed equally.

ETHICAL STATEMENTS

Ethical clearance for the study was obtained from the Institutional Review Board of EHC (2017/20/CE-CHE). All women participating with their infants in the study project provided a written informed consent. Data was processed using unique identifiers for purposes of privacy and confidentiality.

COMPETING INTERESTS

The authors declare that they have no competing interest.

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