A STUDY OF PROLONGED JAUNDICE SCREEN IN HEALTHY TERM BABIES

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ABSTRACT

Prolonged jaundice in most of the term babies is associated with breast milk but in some cases it can be a marker for a range of hepatobiliary, hematological, metabolic, endocrine, infectious and genetic disorders that are associated with significant mortality and morbidity if not diagnosed in time. A diagnosis of conjugated hyperbilirubinaemia warrants urgent investigation. Protocols for investigating prolonged jaundice screen vary in complexity and the yield from screen has not been assessed. In order to address these issues, we carried out a study on healthy term babies referred to our day unit with prolonged jaundice. Infants were examined by pediatrician and investigations done as per unit protocol. Prolonged jaundice screen was found to be helpful in excluding biliary atresia and to support the diagnosis of breast milk jaundice. Present study concluded that negative prolonged jaundice screen is reassuring in healthy term babies and further investigations are unwarranted unless otherwise specified.

KEY WORDS

Term babies, Prolonged Jaundice Screen, Breast feeding, Biliary atresia.

INTRODUCTION

Jaundice is the most common clinical symptom and sign in neonatal period, arising from either overproduction or under secretion of bilirubin. Only a small proportion of babies require investigation as to find a cause of jaundice. Prolonged jaundice can be defined as visibly detectable hyperbilirubinaemia beyond 2 weeks of age in term infant (1). The majority of healthy term infants with prolonged jaundice has unconjugated hyperbilirubinaemia and will be breast feeding. Since breast milk jaundice being a diagnosis of exclusion it is important to exclude other potentially dangerous causes of prolonged jaundice in these babies including that of biliary atresia (2). Purpose of Prolonged jaundice screen is to, facilitate early investigation and management of Conjugated jaundice, avoid Intraventricular hemorrhage (due to vitamin K deficiency), Liver failure and associated long-term morbidity due to biliary atresia

and avoid bilirubin encephalopathy in missed cases of Haemolytic Jaundice.

The present study was undertaken to evaluate our clinical practice and usefulness of unit protocol for prolonged jaundice screen in well, term babies.

MATERIALS AND METHODS

The present study was conducted at between January 2005 and December 2006. Babies were identified from Clinical Coding & Day unit Appointment Book, 60 Cases Identified, 2 Notes could not be Traced, 58 Patient case notes were searched thoroughly, 2 Case notes of Preterm Babies excluded and 36 Suitable cases studied in Detail. Proforma was designed (based on existing unit protocol for prolonged jaundice screen) to collect required data.

All the babies had Stage 1 investigation for prolonged jaundice screen as per unit protocol (Figure 1). Data was analysed using simple statistical methods such as Z-test for proportions and percentage calculation.

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RESULTS

The following observations were made from the present study.

Figure 1 shows the list of investigations done on babies referred for prolonged jaundice screen. All the babies were examined by pediatric senior house officer who records relevant history and examination findings. All the babies had basic investigations (Stage 1) and then depending on examination findings and initial results further investigations were considered in few babies.

Figure 1 : Day Unit protocol for investigating prolonged jaundice

This list is intended as a record of investigations performed
STAGE 1 investigations should be done as first line, others dependent on clinical suspicions

DATE	DONE(tick)	INVESTIGATION	RESULT
STAGE 1 ALL BABIES			
		Bilirubin total/cong	
		FBC, Film & Reticulocytes	
		Urine reducing substances	
		LFT's	
		TSH*	
		T4*	
		CRP	
		Blood cultures If unwell	
		Urine culture + microscopy*	
		Blood group of mother and baby +Coombs test	
STAGE 2 CONJUGATED JAUNDICE			
		U&E's	
		Creatinine	
		LFT's	
		IgM	
		Viral serology HSV	
		TOXOPLASMA	
		RUBELLA	
		CMV(urine x3)	
		Listeria	
		Alph-1-antitrypsin	
		Gal 1 phos UT	
		Amino acids (urine)	
		Organic acids (urine)	
		Hepatitis serology	
		IRT	
		Sweat test	
		Liver USS	
		Isotope liver scan	
		DNA for CF genes	
		Faeces/throat swab for virology	
		Random cortisol	

*For unconjugated hyperbilirubinaemia
Risk ethnic groups)Black, Chinese, Mediterranean)

STAGE 3			
		Urine organic acids	
		Urine amino acids	
		Sweat test	
		IRT	
		Random cortisol	
		Red cell enzymes#	
		G6PD	
		Haemoglobin electrophoresis#	
		Galactose -1-uridyl	

Table 1 shows patient details such as gestation at birth, sex, source of referral, method of feeding and condition of baby at the time of referral. Most of the babies were breast fed, term healthy babies without other clinical concerns mostly referred by community team around 3 weeks of life.

Table 1 : Patient details, Source of Referral and Method of Feeding (n=36)

Gestation at Birth(Weeks)	39(37-42wks)
Sex	Male 18(50%), Female 18 (50%)
Source of Referral	Community Midwife 16 (44%) General Practitioner 1 (3%) Hospital Doctor 3 (8%) Health Visitor 1 (3%) Not Documented 15(42%)
Age at Referral(Days)	21(10-35 days)
Clinical condition of Baby at Referral	Well 35(97%), Lethargic 1(3%)
Method of feeding	Exclusive Breast Feeding 26(76%) Breast & Bottle 6(18%) Bottle 2(6%)
History of Pale Stools & Dark Urine	None 34(94%), Not Documented 2(6%)

Z-test for proportions

Table 2 shows summary of investigations, diagnosis and clinical yield of the Screen. 14 babies in present study with unconjugated hyperbilirubinaemia were exclusively breastfed, who otherwise remained well and kept growing had the diagnosis of breast milk jaundice. 17 babies had no diagnosis but remained healthy and thriving (Negative Screen). These 2 groups together constitutes 85% of study population and all these 31 babies were followed up in the out patient clinic until they turned 5 to 6 wks old by which jaundice resolved

Table 2 : Summary of Investigations/Findings (n=36)

Investigations	Stage 1, Basic Investigations, 36(100%) Stage 2, Conjugated Jaundice, 0(0%) Stage 3, Unconjugated Jaundice, 2(6%)
Total Serum Bilirubin	<200micromoles/L 7(20%) >200micromoles/L 29(80%)
Conjugated Serum Bilirubin	<20micromoles/L 35(97%) >20micromoles/L 1(3%)
Final Diagnosis	Not Documented 17(47%) Breast Milk Jaundice 14(38%) Hemolytic Jaundice 3(9%) Urinary Tract Infection 1(3%) Physiological Jaundice 1(3%)
Diagnostic Value of Screen	Identifiable causes 19(53%) Negative Screen, but healthy baby 17(47%)

Z-test for proportions

uneventfully. One baby with conjugated bilirubin just above 20 micromoles/L (1.2mg/dl) remained healthy without further interventions. 3 babies had mild hemolytic jaundice one of this was due to ABO incompatibility, started on folic acid supplements and finally discharged from clinic once the hemoglobin was stable and had no evidence of on going haemolysis. 2 other babies who had Stage 3 investigations for Unconjugated Jaundice turned out to be G6PD deficient and were referred to further care to the specialist centre. Baby with UTI was treated in accordance with unit protocol on management of UTI. One baby though clinically looked yellow was otherwise healthy with total bilirubin level of 49 micromoles/L (2.9mg/dl) and hence discharged home with diagnosis of physiological jaundice.

Figure 2 shows agreed guidelines for management of well term babies, who remain jaundiced at 14 days of life. The proposed management mainly aims to spot the babies with prolonged jaundice at community level by paramedical person

Table 4: Proposed unit guidelines for community based prolonged jaundice screen (Guidelines for Well, Term Babies who are jaundiced at 14 days old)

such as community midwife who then refer the baby to hospital specialist such as paediatrician who then divides the babies into conjugated and unconjugated group with an aims to investigates further to rule out serious underlying causes such as biliary atresia, missed cases of haemolytic jaundice and rare metabolic disorders affecting liver which can prove fatal to babies if not identified and addressed in time. The above said aims are met in our study as explained in paragraph 3 and hence we proposed above said management guidelines.

DISCUSSION

Jaundice persists beyond 14 days in 15-40% breastfed normal newborns (3, 4). By 10 days of age 90% neonates will have bilirubin concentration <150 micromoles/L. If the total bilirubin concentration is persistently >50 micromoles/L after 14 days or if conjugated bilirubin >20 micromoles/L, then a cause should be sought. Early supportive management of babies with conjugated jaundice of unknown etiology which resolves on its own as babies grow older is very important as these babies are at risk of death due to intracranial hemorrhage (IVH) as they are prone to vitamin K deficiency. One of the important aims of prolonged jaundice screen is to identify a baby with biliary atresia before the age of 6 weeks (5, 6, 7).

Present study was done keeping these principles in mind. The prolonged jaundice screen proved very useful in our study not only by establishing the cause but also to reassure parents as babies with negative screen remained healthy and thriving as noted by our out patient clinic follow up visits. Based on these findings and current available evidence we proposed the guidelines for management of healthy term babies jaundiced at 14 days (1, 2, 5-8). Our guidelines give due importance to good history, examination by a member of pediatric team and investigating in a stage wise manner as directed by tailoring need of an individual baby.

Prolonged jaundice screen in healthy term babies is a useful tool to reassure a parent and clinician, as both positive and negative screen results are equally helpful. Positive screen helps to address the underlying issue urgently whereas negative screen rules out serious underlying causes including that of biliary atresia and support the diagnosis of breast milk jaundice in breastfed babies.

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