



Research Article

A Study on UTI Prevalence of Neonates Younger than 8 Weeks Diagnosed with Prolonged Neonatal Jaundice

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Abstract

Aim: This research aimed to study the UTI prevalence among neonates younger than 8 weeks diagnosed with prolonged neonatal jaundice.

Design and method: This is a descriptive-analytical study on 100 neonates younger than 8 weeks diagnosed with obvious jaundice on skin and eyes in 2015. Demographic and clinical information was collected in order to investigate the UTI through urine bag. If urine test was positive, another sample was cultured. The data were analyzed at $p < 0.05$.

Results: Out of 100 neonates diagnosed with prolonged neonatal jaundice, 27 had positive urine test (4 male and 27 female). Most neonates diagnosed with UTI had a full-term pregnancy, were born with normal delivery, and fed by breastfeeding. The most grown microorganism in urine samples was *Escherichia coli*. According to the results, 23% of asymptomatic neonates with prolonged jaundice were diagnosed with UTI. 73% of culture was negative. Out of 27% positive cases, 17% was reported with *E.coli*, 6% *Klebsiella*, and 4% microorganisms.

Conclusion: According to the results, urine culture, which is among the routine diagnostic measures, is proposed for asymptomatic neonates diagnosed with prolonged neonatal jaundice.

Keywords

UTI Prevalence; Prolonged neonatal Jaundice

Introduction

UTI is a common childhood bacterial infection, affecting 8% of male and 2% of female neonates before the age of 11 years. UTI has nonspecific symptoms. Hyperbilirubinemia may be the only manifestation of UTI [1]. Clinical symptoms are very diverse including nonspecific symptoms in full-term neonates such as fever (38 °C), lethargy, irritability, vomiting, diarrhea, poor nutrition, FTT, septicemia, and febrile seizures [2,3]. Respiratory symptoms such as apnea, hypoxia or tachycardia have been reported among preterm neonates [3,4]. Early diagnosis and treatment of UTI can prevent certain complications such as hypertension, renal failure, and renal scarring block (1). Jaundice is very common among newborn children [5]. Approximately 60-80% of preterm neonates develop jaundice.

Breastfed neonates are more likely to develop jaundice during the first month. 6-18% of full-term neonates diagnosed with severe or prolonged jaundice develop UTI (over 14 days) [1,3,6]. American Academy of Pediatrics (AAP) suggested investigating neonates with increased direct bilirubin levels in terms of UTI [7]. However, the increased level of non-conjugated bilirubin must not be ignored. *E.coli* is the most common pathogen associated with the jaundice in UTI [8-10]. A wide range of diagnoses causes non-conjugated hyperbilirubinemia including UTI infection, hypothyroidism, hypothyroidism, galactosemia, breast feeding jaundice, and liver problems. Renal scar or even kidney failure can be prevented by early UTI diagnosis and treatment [11]. UTI symptoms are nonspecific among neonates. Hyperbilirubinemia is usually the main or sometimes only clinical feature. Prolonged jaundice is reported more in breastfed neonates compared to those with artificial milk. In developed countries, studies on artificial milk-fed neonates suggest that their prolonged jaundice should be immediately checked. Most researchers believe that the Asian ethnicity is considered a risk factor and showed that increased levels of serum bilirubin were twice as much in Asian, American, and Indian neonates as those of white and black population [12]. All above mentioned causes might adversely affect physicians for diagnosing UTI as one of the most important causes of prolonged jaundice. Some studies have proposed UTI laboratory investigation for all asymptomatic patients with prolonged jaundice [13].

Aim

This article aimed to study the UTI prevalence among the neonates younger than 8 weeks diagnosed with prolonged neonatal jaundice

Design and method

This is a descriptive-analytical study on 100 neonates younger than 8 weeks diagnosed with obvious jaundice on skin and eyes in 2015. They visited Amir Al-Momenin Hospital of Zabol, Iran due to the prolonged jaundice. Demographic and clinical information includes age, gender, weight, gestational age, nutrition, and events after birth. "Neonates younger than 8 weeks diagnosed without fever and other symptoms" and "hospitalization due to jaundice" were considered the inclusion criteria. The exclusion criteria were physiological jaundice on the first day, fever, and other clinical symptoms including diarrhea, vomiting, poor feeding, tachypnea, lethargy, and irritability. Urine samples were collected by urine bags. If the urine test result was positive, another sample was sent for culturing. The data were analyzed in SPSS21 by descriptive statistics (mean, standard deviation, frequency, and frequency percentage) and analytical statistics (T-test and X²) and $P < 0.05$ significance level.

Results

Out of 100 neonates diagnosed with prolonged jaundice, 27 were reported with positive urine culture (4 males and 23 females). Most neonates, diagnosed with UTI had a full-term pregnancy, were born with normal delivery, and breastfed. The most grown microorganism in urine samples was *Escherichia coli* (Table 1).

Hyperbilirubinemia is a sign of neonatal bacterial infection which has been reported in numerous UTI studies [6,14]. Urine

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Table 1: Grown microorganism in urine samples was *Escherichia coli*.

Variable		Positive Urine Culture	Negative Urine Culture	P-Value
Gender	Male	4 (11.8%)	30 (88.2%)	0.014
	Female	23 (34.8%)	43 (65.2%)	
Gestational Age	Full-term	22 (23.9%)	70 (76.1%)	0.018
	Preterm	5 (62.5%)	3 (37.5%)	
Type of Delivery	Natural	16 (21.6%)	58 (78.4%)	0.041
	Caesarean Section	11 (42.3%)	15 (57.7%)	
Nutrition	Breastfeeding	22 (25%)	66 (75%)	0.003
	Milk Powder	4 (100%)	0 (0%)	
	Breastfeeding+ Milk Powder	1 (12.5%)	7 (87.5%)	
WBC		9614.81 ± 2714.16	8052 ± 1483.06	0.008
Total Bilirubin		18.81 ± 3.69	17.33 ± 4.27	0.01
Direct Bilirubin		94 ± 3.69	64 ± 0.49	0.012
Organism	E.Coli	17		0.001
	Klebsiella spp	6		
	Other	4		

analysis and culture are performed to reject the sepsis in terms of microorganism growth in icteric neonates. However, routine urine analysis and culture are not performed among some neonates with indirect hyperbilirubinemia. This causes the lack of UTI diagnosis. The results of some studies have indicated that bacterial infection of the urinary tract can progress the neonatal jaundice during the course of the disease [3,8,15]. According to our study, 23% of asymptomatic neonates developed UTI. The prevalence was reported, however, 12.9-18% in other studies [1,16,17]. A study in Turkey emphasized the importance of routine urine culture for all neonates diagnosed with neonatal jaundice [14]. Greater prevalence was reported among female neonates in our study (P=0.014), which is consistent with the study by Pashapour et al. [1]. Despite our study, the results of other studies reported UTI prevalence in male neonates, which is likely to be associated with the fact that no gender superiority was found in terms of neonatal UTI [16,18]. According to our results, 81.5% of the neonates diagnosed with UTI had full-term gestational age, which is consistent with the results of other studies [14,16,19]. Increased bilirubin caused by UTI is associated with non-conjugated hemolysis linked with the certain microorganisms such as E.coli and other gram positives [16]. In this study, 73% of urine culture was negative, while, out of remaining 27%, 17% had E.coli, 6% Klebsiella, and 4% other microorganisms, which are consistent with the results of the study by Garcia and Mall [8,16], and inconsistent with those of Biljen. Such inconsistency can be associated with regional diversity and prevalence of bacteria [14]. Out of 100 neonates, 74 were born with natural delivery and 26 with caesarean section. 16 and 11 neonates, born with natural delivery and caesarean section, had UTI, respectively. Therefore, a significant relationship was found between UTI prevalence and type of delivery (P-Value=0.041).

Conclusion

According to the results of our study, urine culture, which is among the routine diagnostic measures, is proposed for asymptomatic neonates diagnosed with prolonged neonatal jaundice.

Ethical Aspects and Conflict of Interest

This study approved by ethic committee of Isfahan University of medical science. The authors declare that they are aware of no conflict of interest

Author Contribution

Concept and design (MH), data collection (MT), data analysis and interpretation (MH), drafting of the manuscript (MH,MT), critical revision of the manuscript (MT), the final completion of the article (MH).

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