

Urinary Tract Infection Amongst Neonates Having Asymptomatic Jaundice

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ABSTRACT

Objective: The frequency of Urinary tract infections (UTI) amongst neonates having asymptomatic jaundice.

Study Design: cross sectional study.

Place and Duration of Study: This study was conducted at the Paediatrics Department of Services Hospital, Lahore from August 2018 to March 2019.

Materials and Methods: We enrolled 160 neonates with asymptomatic jaundice having no history of fever from last 2 weeks. Frequency of UTI was noted among all the study participants. All the information regarding this study was noted on a predesigned proforma. SPSS version 21 was used for data entry and analysis for this study. Chi square test was used to see any difference of study variables among the study participants with or without UTI and p value ≤ 0.05 was taken as significant.

Results: Amongst a total of 160 neonates, there were 89 (55.6%) male and 71 (44.4%) female. Overall, mean age was found to be 20 days with a standard deviation of 3.8 days. Most of the children, 93 (58.1%) were between the age of 21 to 28 days while remaining 67 (41.9%) 14 to 21 days. UTI was present in 15 (9.4%). The most common pathogen involved in UTI was E. Coli in 6 (40.0%), klebsiella in 4 (26.7%), staph epidermidis in 2 (13.3%), enterobacter in 2 (13.3%) and pseudomonas in 1 (6.7%).

Conclusion: UTI is common in neonates having afebrile asymptomatic jaundice. Commonest pathogens involved are E.coli and klebsiella. Asymptomatic neonates presenting with jaundice should be given special attention to rule out UTI for the early diagnosis and management.

Key Words: Urinary tract infection, asymptomatic, afebrile, jaundice.

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INTRODUCTION

Urinary tract infection (UTI) is commonly found amongst pediatric population. Renal Delayed diagnosis may have consequences of a life-long nature.^{1,2} Infancy period is known to be the most common age group for UTIs. UTI is usually exhibited in the form of pyelonephritis, asymptomatic bacteriuria or cystitis.³ In newborns, presentation is commonly in the form of hypothermia, cry that is usually high pitched, inability to thrive or changes in skin color.

Abdominal distension, diarrhea or vomiting is commonly seen in neonates. Jaundice or skin rashes are also some of the other manifestations.^{2,4} Fever, hypothermia or clinical jaundice are the most frequent presentations among neonates or infants whereas children of subsequent ages have micturition problems or dysuria, usually reported with irritable cry. Inability to gain weight or loss of appetite are the most important findings for UTI in infants. Urine culture is advised when children have jaundice.⁵⁻⁷

Evidence shows that relying only on history and clinical examination is not enough for the early diagnosis of UTI so further investigations like urine culture should be ordered whenever indicated.⁸ A local study from Lahore⁹ noted that 73% of children with UTI were having fever while inability to gain weight was recorded in 47%. Another local study from Hazara reported that 65% of children were having dysuria.¹⁰

Neonatal jaundice is commonly seen in about 60% babies.^{11,12} Underlying diseases to neonatal jaundice are rare but jaundice can be 1st sign of UTI among neonates. Susceptibility to UTI among neonates is increased because of low uro-epithelial bactericidal activity, decreased levels of immunoglobulin A, low capacity of urinary acidification and high peri-urethral colonization among neonates. Most of the symptoms of UTIs among neonates, like fever, inability to thrive,

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irritability, lethargy vomiting, jaundice, are non specific so early diagnosis is challenging.¹¹ Amongst newborns, jaundice can be taken as the initial symptom linked to UTIs.⁷ In a study conducted by Ghaemi S et al¹³ noted 5.8% infants with UTI to have late onset jaundice whereas a Local study from Lahore⁴ reported the frequency of UTI as 7.3% in neonates who had asymptomatic jaundice. UTI has also been named as a factor responsible for prolonged jaundice among neonates.¹⁴

Not much work is found seeking frequency of UTI among neonates presented with jaundice so we aimed this study to find out the frequency of Urinary tract infections (UTI) amongst neonates having asymptomatic jaundice. The findings of our study will be helpful in identifying the patterns of UTI in these neonates. Our study will not only be a valuable addition to little literature on this topic but also lay the basis for future trials evaluating any possible relation between UTI and jaundice among neonates.

MATERIALS AND METHODS

Paediatrics Department of Services Hospital, Lahore was the center for this cross sectional study that was done from 1st August 2018 to 31st March 2019.

A minimum sample of 150 neonates was calculated considering 95% confidence interval while anticipated frequency of UTI was taken as 8.2% among neonates¹⁰ with jaundice. We enrolled, 160 neonates with jaundice (discoloration of sclera, skin or mucous membrane) having no history of fever from last 2 weeks, from outdoor and emergency department, using non-probability purposive sampling. Neonates having fever (more than 38°C), diarrhea, nausea or vomiting, irritability, lethargy, tachypnea, abnormal LFTs or having any liver or cardiac diseases were not included. Approval from institute's ethical and research committee was sought for this study. Informed consent was taken from parents / guardians of all the study participants. Frequency of UTI was noted among all the study participants. UTI was labeled as "growth of $\geq 10^5$ CFU/ml of a single urinary tract pathogen in catheterized sample".⁴

Patient's name along with age and sex were recorded. Catheterized urine was sent to institute's laboratory for presence or absence of urinary tract infection. All the information regarding this study was noted on a predesigned proforma.

SPSS version 21 was used for data entry and analysis for this study. Mean and standard deviations were calculated for quantitative variables like age whereas frequency and percentages were tabulated for gender and presence or absence of urinary tract infection. Chi square test was used to see any difference of study variables among the study participants with or without UTI and p value ≤ 0.05 was taken as significant.

RESULTS

Amongst a total of 160 neonates, there were 89 (55.6%) male and 71 (44.4%) female. Overall, mean age was found to be 20 days with a standard deviation of 3.8 days. Most of the children, 93 (58.1%) were between the age of 21 to 28 days while remaining 67 (41.9%) 14 to 21 days. We noted that 121 (75.6%) neonates were registered from emergency department while 39 (24.4%) from outdoor. There were 120 (75.0%) neonates who had weight below or equal to 3 kg while 40 (25.0%) had weight above 3 kg.

Out of a total of 160 neonates, UTI was present in 15 (9.4%). The most common pathogen involved in UTI was noted to be E. Coli, found in 6 (40.0%), klebsiella in 4 (26.7%), staph epidermidis in 2 (13.3%), enterobacter in 2 (13.3%) and pseudomonas in 1 (6.7%). Out of 112 (70.0%) neonates having indirect hyperbilirubinemia, 7 (46.7%) had UTI while out of a total of 48 (30.0%) neonates having direct hyperbilirubinemia, 8 (53.3%) had UTI.

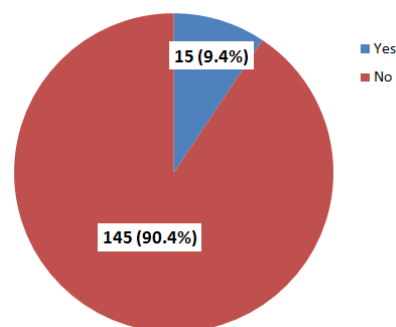


Figure No.1: Frequency of UTI amongst Neonates With Asymptomatic Jaundice (n=160)

Table No.1: Presence or Absence of UTI in comparison to Study Variables

Study Variables		Presence of UTI (n=15)	Absence of UTI (n=145)	P value
Gender	Male	9 (60.0%)	80 (55.2%)	0.79
	Female	6 (40.0%)	64 (44.8%)	
Age (days)	14-21	7 (46.7%)	60 (41.4%)	0.78
	22-28	8 (53.3%)	85 (58.6%)	
Weight (kg)	≤ 3	10 (66.7%)	110 (75.9%)	0.53
	> 3	5 (33.3%)	35 (24.1%)	
Direct hyperbilirubinemia		8 (53.3%)	40 (27.6%)	0.07
Indirect hyperbilirubinemia		7 (46.7%)	105 (72.4%)	

Table No.2: Causative Organisms of UTI amongst neonates having asymptomatic jaundice (n=15)

Causative Organism	Number (%)
E.Coli	6 (40.0%)
Klebsiella	4 (26.7%)
Staph Epidermidis	2 (13.3%)
Enterobacter	2 (13.3%)
Pseudomonas	1 (6.7%)

When neonates having UTI were compared with those without UTI, there was no significant difference in terms of gender, age, weight or types of hyperbilirubinemia (p value > 0.05).

DISCUSSION

The possible linkage between neonatal jaundice and UTI is becoming a topic of interest. It has been documented in the past that UTI can be found in neonates having jaundice even without any symptoms. Chavalitdhamrong et al in 1975¹⁵ concluded, in his study analyzing 69 neonates who were asymptomatic along with having unexplained jaundice, infection was noted to be a common cause of unexplained prolonged jaundice in newborns.

We noted the frequency of UTI as 9.4% (n=15) in asymptomatic jaundiced neonates. Frequency of UTI in asymptomatic, afebrile and infants having jaundice was noted to be 6% in a study examining 217 cases,¹⁶ 5.8% in another study evaluating 400 neonates,¹³ 6% in a study having 100 neonates aged between 14 to 28 days,¹⁴ 7.8% in neonates who were younger than 2 weeks,¹⁷ 12.5% in another study evaluating neonate¹⁸ whereas 18% in another study amongst neonates aged 4 to 14 days.¹⁹ A study examining 462 neonates having jaundice⁵ noted a 6.5% frequency of UTI while they noted 68% neonates as asymptomatic. Most of these findings in terms of above mentioned studies are aligned with our results in terms of frequency of UTI amongst afebrile jaundiced neonates. Omar C and coworkers²⁰ retrospectively analyzed asymptomatic, jaundiced neonates for UTI and noted that 32 (21.1%) out of a total of 152 neonates were having UTI.

Rooney J et al,²¹ evaluating 22 jaundiced babies found a much higher proportion of UTI as 40% but possible difference to our findings could be that the mentioned study had cases with bacterial infection having sign and symptoms of sepsis. Pashpour N et al¹⁴ found a frequency of UTI as 6% amongst neonates having unexplained jaundice while mean age at the time of admission was noted to be 23.0 ± 5.9 days which is quite similar to what we found in our study.

In the current study, the most common pathogen involved in UTI was noted to be E. Coli, found in 6 (40.0%) neonates, klebsiella in 4 (26.7%), staph epidermidis in 2 (13.3%), enterobacter in 2 (13.3%) and pseudomonas in 1 (6.7%). Our study was very similar to another study conducted in Lahore⁴ where E.coli

followed by klebsiella were found to be the commonest pathogen involved in UTI in neonates with asymptomatic jaundice. It has been proposed in the past that pathogenesis of jaundice in relation to UTI may be hemolysis due to E.coli or some other gram negative pathogens that could result in unconjugated hyperbilirubinemia.^{22,23} Cholestasis can be the reason of direct hyperbilirubinemia while some previous researches demonstrated that UTI may exhibit in newborns with indirect hyperbilirubinemia early one but with conjugated hyperbilirubinemia following 6 weeks to 22 weeks.²⁴ The exact mechanism of UTI causing conjugated hyperbilirubinemia is not known but some hypothesis including toxic effects from bacterial products, micro-circulatory alteration related to liver and from endotoxins induced mediators could be the possible reasons why UTI is reported more in conjugated hyperbilirubinemia.²⁵ Falcao MC et al²⁶ also noted E.coli to be the most common organism in newborns having UTI that is pretty similar to our findings.

CONCLUSION

UTI is common in neonates having afebrile asymptomatic jaundice. Male babies are affected more while commonest pathogens involved are E.coli and klebsiella. Asymptomatic neonates presenting with jaundice should be given special attention to rule out UTI for the early diagnosis and management.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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