

## ORIGINAL ARTICLE

# RESULTS OF URINE AND BLOOD CULTURES IN HEALTHY JAUNDICED NEWBORNS: MAKING THE CORRECT CHOICE

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**Background-** Jaundice is one of the presenting signs of sepsis and/or urinary tract infection (UTI) in newborns. Physicians who provide care to jaundiced but otherwise healthy neonates frequently wonder whether they should perform a sepsis work-up in this situation. This prospective study was performed to evaluate the incidence of sepsis and UTI in healthy neonates with jaundice, who were admitted to Mofid Children's Hospital from September 1997 to August 1999 and to determine the importance of performing a sepsis work-up in this group of infants.

**Methods-** Five hundred consecutive neonates with jaundice were enrolled in this study. One hundred of the neonates were excluded from the study due to at least one exclusion criterion. A single neonatologist performed all physical examinations and obtained all blood and urine specimens. The urine was collected via suprapubic aspiration. The blood and urine cultures were treated according to standard methods.

**Results-** Of the 400 neonates entered into the study, none had positive blood culture and only two (0.5%) had positive urine cultures.

**Conclusion-** Performing blood and urine cultures is not necessary and should not be considered as a routine procedure in the evaluation of jaundiced but otherwise healthy newborn infants.

**Keywords** • blood culture • neonatal jaundice • neonatal sepsis • urine culture  
• urinary tract infection

### Introduction

Jaundice is one of the most common problems during the neonatal period. About 60% of the full term and 80% of premature infants may develop jaundice during the first week of life.<sup>1</sup> In many cases, jaundice is a physiologic phenomenon but in some cases, it may indicate some underlying pathologic problems such as blood group incompatibilities, hemolysis due to enzymatic defects or infection, as well as many other causes.

Sepsis is responsible for less than 2% of cases

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of neonatal jaundice.<sup>2</sup> Since jaundice is one of the manifestations of neonatal sepsis and/or UTI, and is occasionally the only sign<sup>1</sup>, physicians who are responsible for providing care to jaundiced neonates frequently worry about not doing a sepsis work-up for healthy jaundiced neonates. In some neonatal centers throughout the world, blood and urine cultures are obtained in these special groups of neonates to rule out infection.<sup>3</sup> These procedures are invasive, time consuming and also expensive, and in many cases, do not yield any results.<sup>2</sup>

The present study was performed to evaluate the incidence of sepsis and UTI in jaundiced but otherwise healthy neonates, to determine the importance of performing a sepsis work-up in this group of infants.

## Materials and Methods

A total of 500 newborn infants with jaundice, who were admitted to the Neonatal Unit of Mofid Children's Hospital, Tehran, Iran, from September 1997 to August 1999 were consecutively enrolled in the study. Of these, 400 infants were qualified to enter the study and 100 infants, who did not fulfill the inclusion criteria, were excluded from the study. The inclusion criteria consisted of the following: absence of any sign of sepsis but jaundice, having no history of antibiotic intake, direct bilirubin less than 1.5 mg/dL, birth weight more than 2500 g, gestational age more than 37 weeks, absence of congenital anomalies, hemolysis due to blood group and Rh incompatibilities or G6PD deficiency, lack of prolonged rupture of amniotic membranes for more than 18 hours and absence of maternal fever were considered as inclusion criteria.

A single neonatologist performed physical examinations and obtained blood and urine specimens from all of the infants. After cleaning the site with Betadine solution, 1 mL of venous blood was withdrawn and cultured in 10 mL of trypticase soy broth, and then incubated at 37°C for seven days. These cultures were then subcultured to blood and chocolate agar media. After 24 hours, 48 hours and 1 week, the media were checked for growth of any microorganisms.

Using a 2 mL syringe and a 22-gauge needle, urine samples were obtained by suprapubic aspiration under sterile conditions, and cultured on standard agar culture media. The urine cultures were evaluated after 48 hours. The growth of even one colony of microorganism was considered as positive.

## Results

Among the 400 newborns, 256 (64%) were males and 144 (36%) were females. Jaundice appeared in majority of cases (95%) from birth to 7 days of age. The birth weights of these infants ranged from 2,500 g to 2,999 g in 116 (29%) cases, from 3,000 g to 3,499 g in 212 (53%) cases, from 3,500 g to 3,999 g in 60 (15%) cases and was 4000 g or more in 12 (3%) cases. The bilirubin level was ranged from 16 to 25 mg/dL in 91% of cases. A bilirubin level of 30 mg/dL or more was observed in only 2% of neonates. None of the neonates had positive blood cultures and only 2 neonates (0.5%)

had positive urine cultures for *Escherichia coli*.

## Discussion

Nearly 60% of full-term and 80% of premature infants develop jaundice during the first week of life.<sup>1</sup> Although jaundice could be a physiologic phenomenon in newborn infants, in some cases it may be the presenting manifestation of a pathological condition such as hemolysis or sepsis.

Sepsis is the cause of jaundice in less than 2% of cases.<sup>2</sup> However, about one third of newborns with sepsis present with jaundice.<sup>2</sup> The incidence of sepsis in newborn infants ranges from 1 to 5 in 1000 live births.<sup>4</sup> The clinical manifestations of neonatal sepsis are nonspecific and include disturbance in thermal regulation, respiratory distress, apnea, poor feeding, abdominal distension and jaundice. In nearly one third of the cases, jaundice may be one of the presenting signs, or the only sign, of neonatal sepsis.<sup>2,4</sup>

UTI can be a part of the process of neonatal sepsis and its clinical manifestations are also nonspecific. The incidence of UTI is between 0.1% and 1% of all newborns, with a higher incidence in premature infants.<sup>4</sup>

Jaundice may be the first or the only sign of UTI in newborn infants.<sup>4</sup> Considering that the manifestations of sepsis and UTI are nonspecific in neonates and the consequences of misdiagnosis and treatment could be unfortunate, many physicians perform a sepsis work-up for all infants who present with jaundice.

In one study, out of 93 infants with jaundice and without any other signs of sepsis, 3 (3.2%) had septicemia.<sup>3</sup> In another study, jaundice was one of the main clinical manifestations of UTI.<sup>5</sup> In another study in which 306 newborns with indirect hyperbilirubinemia (serum total bilirubin,  $18.5 \pm 2.8$  g/dL) were included, none had proven sepsis.<sup>6</sup>

In our study, none of the neonates had a positive blood culture and only two (0.5%) had a UTI, a result similar to the results of blood and urine cultures of the general population of healthy newborns. According to the results of the present study, we do not recommend performing a sepsis work-up in neonates with jaundice but no other sign of sepsis.

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