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Original Research Paper

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STREPTOCOCCUS PYOGENES IN NEW BORN: A CASE REPORT

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ABSTRACT *Streptococcus pyogenes* (Group A *Streptococcus,* GAS) is a rare cause of bacterial meningitis, accounting for less than 1% of cases. GAS meningitis has rarely been reported in children, and is associated with a high (46%) rate of morbidity and a high (10-17%) case fatality rate. This case report describes *Streptococcus* infection in the neonate immediately after birth which was diagnosed on automated blood culture. The clinical course showed meningeal signs but the recovered without sequelae and was discharged on day 8 of life on medication. *Streptococcus pyogenes* is a rare cause of bacterial meningitis but has to be considered as the causative pathogen beyond the neonatal period.

KEYWORDS : Streptococcus pyogenes, neonates, sepsis

INTRODUCTION:

Group A *Streptococcus* (GAS) is associated to various clinical presentations in children—from benign to severe invasive infections. In different countries, GAS was involved in 3–5% of bloodstream infections in children (1, 2). Neonatal infections are mainly caused by group B *Streptococcus* and *Escherichia coli*, whereas GAS is rarely involved (2). Very few data is available on Invasive Group A *Streptococcus* infection (IGASI) in <3-month-old infants (3), while their potential severity requires early identification and appropriate management. In this case, we present a pregnant female who has given birth to a newborn with a diagnosis of beta-hemolytic *Streptococcus* meningitis group A, a rare location in children.

Case History:

39-year-old female gave birth to a newborn with a birth weight of 4.62 lbs through an emergency lower segment caesarean section (EmLSCS). The delivery occurred at 36 weeks of gestation when the mother experienced early labor and presented with intrahepatic cholestasis of pregnancy (IHCP) in the Emergency Department of the hospital. Soon after the birth newborn develops distressing clinical symptoms, including tachypnea, tachycardia, seizures, subcostal retractions, and hypoglycemia therefore he was shifted to NICU. The initial APGAR score was 5/7, indicating the need for immediate medical attention. The baby was kept on CPAP mode with settings PEEP-7, FiO2 -50%, RR -85/min, HR-150/min, SPO2-95%.

Further evaluation revealed Hb-20.4gm/dl, HCT count-58.4%, RBC-5.89million, WBC count-20.220mm/3 absolute neutrophil count-11,430/mm3 while absolute lymphocyte count-6,370mm/3. Metabolic disturbances, with arterial blood gas analysis indicating a mild metabolic acidosis, elevated lactate levels, and electrolyte imbalances. (pH- 7.4, PCO2 -31.3, HCO3 -19.8, Lactate-4.86, Na+-142, K+ -4, Cl- -1.84). Other laboratory parameters were Serum Blood urea 15.51 mg/dl, BUN 7.25 mg/dl, Serum Creatinine 0.74 mg/dl, Serum uric acid 6.88 mg/dl, Serum Potassium 6.06 mg/dl, Serum SGOT 93.70 U/L, Serum Bilirubin, Total 2.79 mg/dl, Serum Bilirubin, Indirect 2.79 mg/dl respectively.

Venous blood was inoculated into BacT/ALERT Pediatric blood culture bottles (bioMérieux, Durham, NC). Bottles were incubated in a BacT/ALERT 3D continuous monitoring blood culture instrument. Blood culture on Day 2 of life flagged positive on BACT/Alert. Positive blood culture bottles were subcultured to blood agar, Mac Conkey agar, and a Gram stain was performed. Colonial morphology, routine biochemical tests were done. Gram stain revealed gram-positive cocci in chains. On Blood agar it showed beta-hemolytic colonies (figure:1) which was further evaluated for identification and Antimicrobial susceptibility testing as per standard guidelines identified as *Streptococcus pyogenes*, indicating a bacterial infection. The Antimicrobial susceptibility testing was performed using Kirby Baeur disc diffusion method recommended by CLSI M100 33Ed *Streptococcus pyogenes* sensitive to vancomycin, linezolid and, penicillin while resistant to erthromycin, clindamycin, cotrimoxazole, levofloxacin and azithromycin. The patient received a comprehensive treatment regimen, including intravenous Empirical treatment for sepsis was begun and the patient responded well. After seven days of medical intervention, the newborn demonstrated clinical improvement and was discharged after giving proper instructions.

DISCUSSION:

Despite the initial adoption of antibiotics and advancements in healthcare, the prevalence of complications stemming from GAS infections remains a substantial public health challenge, particularly in developing nations (5). This study documents the case of a newborn who exhibited respiratory distress and was subsequently diagnosed with a *Streptococcus pyogenes* infection through blood culture. While uncommon, our research confirms a notable correlation between early-onset invasive group A *Streptococcal* infections (IGASIs) and the severity of clinical symptoms in neonates. The clinical features observed in our study closely resembled those documented by Germont Z *et al*. in their research, wherein *Streptococcus pyogenes* (GAS) infections were infrequent but severe, carrying a substantial risk of mortality (4), In another investigation conducted by Spaulding AB et al., it was revealed that GAS infections in neonates constituted 21% of cases and generally resulted in favorable clinical outcomes (2). In this study neonate displayed meningeal signs, a clinical presentation akin to the one described by Amer A. Lardhi in 2008(7). However, our findings differ from the research conducted by Miyairi I *et al*., where the newborn succumbed within 36 hours of birth, and subsequent blood

culture unveiled a GAS infection (3). The newborn was affected by a severe disease and exhibited more of respiratory disorders.

In our present study, the neonates exhibited signs of sepsis, such as tachypnea, tachycardia, and intercostal retractions, a pattern akin to the research conducted by Ozmeral Odabasi İ *et al,* where similar features were observed (8). Furthermore, in our case, neonate CRP level fell within the normal range, similar findings observed by Ozmeral Odabasi İ *et al,* where none of the patients displayed elevated CRP levels when tested within the first 24 hours of life. (8)

Concluding it, this case is a rare occurrence of beta-hemolytic *Streptococcus* meningitis group A in a neonate. Prompt diagnosis, appropriate treatment, and close monitoring were crucial in managing this serious infection. The successful response to intravenous antibiotics, along with the baby's clinical improvement, underscores the importance of early identification and intervention in cases of invasive Group A *Streptococcus* infection in neonates, emphasizing the potential severity and need for immediate medical attention.

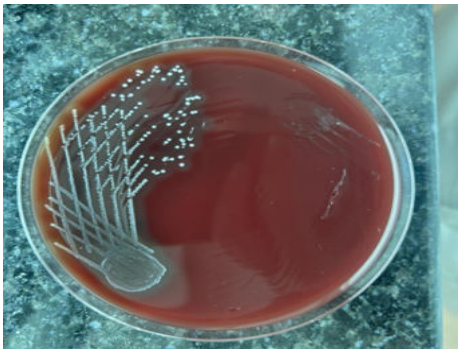

Figure 1: Image showing Beta hemolytic colonies of *Streptococcus pyogenes*

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