CASE REPORT

IF THE MIND KNOWS, THE EYES CAN SEE – THE FIRST CASE OF NEONATAL LISTERIOSIS REPORTED FROM EASTERN INDIA

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ABSTRACT: A three day old baby delivered at B. S. Medical College Hospital, Bankura developed features of neonatal septicaemia two days after normal delivery. Patient's blood culture sample was processed in BacT/Alert 3D Automated blood culture system. Positive growth signal was obtained at 48 hrs. Subculture on solid non-selective and selective media, morphological studies including typical motilities and standard recommended bio-chemical tests revealed the isolate to be *Listeria monocytogenes*. Antibigram studies further corroborated the identity of the isolate. This case report underlines the importance of Automated blood culture detection system in the identification of fastidious but clinically dangerous pathogens. This is most probably the first report of neonatal septicemia due to *Listeria monocytogenes* from eastern India.

KEY WORDS: *Listeria monocytogenes*, Neonatal Septicemia, Automated Blood Culture System

INTRODUCTION: *Listeria monocytogenes* is a relatively rare aerobic, gram positive non-spore forming bacillus causing human infection most commonly in neonates. It can survive in a wide range of environmental conditions. The temperature tolerance of this bacteria ranges from 4^o C to 37^o C. It can withstand high salt concentration and low pH¹. These properties indicate that they can overcome food preservation procedures and safety barriers, thus becoming an important and highly fatal food borne pathogen². It has been found that 20-30% of clinical infections can result in death³. The first case of human listeriosis was reported in March, 1978 from South Africa⁴.

CASE HISTORY: This case report is being made from the Department of Microbiology, Bankura Sammilani Medical College, Bankura which is one of the well known government run teaching hospitals in West Bengal and has a well equipped Microbiology laboratory. The patient was a three day old baby whose birth weight was 2.5 kg. Delivery was institutional (in this hospital) and full term. Two days after normal vaginal delivery the patient presented with frequent episodes of convulsions. Each episode lasted for 5-10 minutes. The baby was immediately transferred to the SNCU (Sick New Born Unit) of this hospital. Examination revealed: Anaemia, Jaundice, Oedema & Clubbing – Nil, Chest- Clear, Heart sounds - S1, S2 audible, Abdomen- Soft, Liver & Spleen- Not palpable. Patient was diagnosed provisionally as Neonatal Septicaemia. CBC

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revealed Neutrophil 7,000/cc, ESR 30 mm first hour, Platelet count 2,10,000/cc. 0.5 cc of blood was sent for culture in BacT/ALERT 3D Select system in appropriate culture bottle. CSF sample could not be collected as the baby was suffering from repeated convulsions. Treatment was started with Inj. Cefotaxime & Amikacin, Inj. Gardenal, Inj. Vit K, I.V fluid with Isolyte P.

Culture media provided in BacT/Alert 3D Select blood culture bottle contains Soyabean Caesin Digest, Sodium Polyanethol Sulfonate, Pyridoxine, Menadione, Hemin, L-Cysteine Broth with Brain Heart infusion. The culture bottle was incubated at 37° C in an atmosphere of CO₂ in oxygen and nitrogen under vacuum in the above system and positive growth signal was obtained in 48 hours. Direct smear was made from Blood Culture bottle and stained by Gram stain. Smear showed small non-sporing gram positive bacilli. Arrangement was mostly single, few pairs, few short chains, V and L shaped diphtheroid arrangements were found also. There were no granules. Typical pallisades were not seen. Subculture was made in 5% Sheep Blood Agar, Nutrient Agar & MacConkey Agar. The plates were incubated at 37° C for 24 hrs.

CULTURE FINDINGS: After 24 hrs in 5% Sheep Blood Agar, small zone of haemolysis was seen around the discrete colonies. In Nutrient Agar, small translucent colonies and in MacConkey agar no growth occurred. Growth on selective medium, Palcam Listeria Selective Supplement Agar was also checked. Smear was made from the colonies on Blood Agar and Nutrient Agar and Listeria selective medium and stained with Gram stain. Gram positive non-sporing bacilli having the previous characteristics were detected. One inoculated peptone water tube was incubated for 2 hrs at 37° C and another was incubated at 24° C for 2 hrs. Hanging drop preparations were made from both tubes. Most of the bacilli incubated at 37° C were non-motile and most bacilli incubated at 24° C showed typical tumbling motility. Biochemical reactions: Catalase test – positive, Oxidase test – Negative, Glucose & Maltose fermented with production of acid only and aesculin hydrolysis were positive. MR and VP – Positive, CAMP Reaction was also positive.⁵

FINAL DIAGNOSIS: So the patient, a new born baby following vaginal delivery developed neonatal septicemia with convulsion whose aerobic blood culture yielded positive result showing Gram positive bacilli with characteristic arrangement. This is followed by the culture finding of growth in 5% Sheep Blood Agar with haemolysis & growth in Nutrient Agar, but no growth in Mac Conkey Agar. Tumbling motility at 24°C and no motility at 37°C with the characteristic biochemical test findings clearly pointing towards a diagnosis of *Listeria monocytogenes*. Antibiotic susceptibility testing was done by Kirby-Bauer disc diffusion method. The organism was sensitive to Ampicillin, Co-trimoxazole and Gentamycin and it was resistant to Cephalosporin and Fluoroquinolones.

Listeriosis in man may show diverse clinical features. Meningitis is a very important outcome of *L. monocytogenes* infection in newborn, elderly and immunocompromised patients. Asymptomatic infection of the female reproductive canal may cause intranatal infection of the newborn, as was most probably the case in this patient. The patient was discharged early after delivery.

As neonatal listeriosis has never been reported from this region of West Bengal, this case definitely needs to be reported. Scanning of scientific literature revealed four previously reported cases of neonatal listeriosis from India (Mokta KK et al 2016⁶, Gogate AA et al 1981⁷, Khan Sadia et al 2011⁸, and Gupta Ritu et al 1997⁹), but none of these cases were from eastern India. This should be an eye-opener to clinicians who need to be more vigilant. This case also authenticates the great diagnostic sensitivity of automated blood culture systems in the detection of fastidious blood pathogens.

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