

Fatal empyema thoracis due to *Nocardiaasteroides* in a neonate

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Abstract:

A 40 day old male infant presented with fever, cough, breathlessness and refusal to feed for two weeks. X-ray chest showed right lung consolidation. Computed Tomography (CT) scan of chest revealed bilateral lung consolidation. Frank pus aspirated from pleural tapping showed Gram positive thin branching filaments. The specimen was processed on Blood agar and Lowenstein – Jensen medium. The colonies grown were identified as *Nocardiaasteroides* by microbiological techniques. After seven days of admission patient deteriorated. CT scan showed multiple brain abscesses. In spite of extensive medication, patient did not improve and finally succumbed to infection. Nocardiosis is an uncommon infection which occurs infrequently in children. Hence presenting this case due to its rarity.

Key Word: *Nocardia*, empyema, nocardiosis

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I. Introduction

Nocardiaasteroides is an aerobic Gram positive filamentous bacterium present worldwide. Nocardiosis is an uncommon infection, which occurs infrequently in children. The disease mainly occurs as a secondary infection in patients with chronic granulomatous disease and impaired CMI such as HIV disease, recipients of organ transplants, those receiving corticosteroids and chemotherapeutic agents.^[1]

There are very few cases of nocardial infections in neonates in the world literature, hence this case was reported due to its rarity.

II. Case Report

A 35 day old male infant was admitted with fever, cough, breathlessness and refusal to feed for two weeks. Fifteen days back patient had fever, cough, breathlessness, which was treated in a private clinic with no improvement. Patient was given piperacillin – tazobactam and monocef. He also had right sided umbilical discharge for the past 10 days and history of ingestion of cow's milk. The child was full term, 2.8 kg neonate, delivered by normal labour with no antenatal and perinatal complications and was immunized till date.

Physical examination revealed body temperature of 38°C, pulse rate of 100/min. On chest examination air entry was decreased on right side. Crepitations were felt on right side of chest. Umbilical discharge was present. There was no history of bleeding from any site. Few pigmented patches were noted on trunk. Rest of the physical examination was within normal limits.

Laboratory investigations disclosed a Haemoglobin of 11.8 mg/dl, Total leucocyte count of 14,600/cumm with 55% neutrophils, 40% lymphocytes, 3% eosinophils and 2% monocytes and adequate platelets. Blood culture revealed no growth. The chest X-ray showed right sided consolidation (Fig.1) USG Chest showed 3.8 x 3.5 cm lesion in right apical lobe with mobile interechoes with mild central vasculature suggestive of abscess. CT scan chest also showed right sided consolidation. Gram stain of frank pus aspirated from USG guided pleural tap showed Gram positive branching filaments (Fig. 2); which were acid fast by modified ZN staining (1% H₂SO₄). The specimen was inoculated on blood agar (Fig 3), Lowenstein - Jensen medium. (Fig 4) Colonies grown were identified as *Nocardia spp.* by Standard microbiological tests.^[2]

Speciation of *Nocardia* was done by antibiotic susceptibility testing using Gentamicin (10µg), Tobramycin (10µg), Amikacin (30µg), Erythromycin (15µg) discs after matching the suspension with 0.5 McFarland standard. But since there was poor growth on Mueller Hinton agar, blood agar was used. Plates were incubated at 35°C in air for 72 hours. Zone diameters were measured and interpreted as gentamicin ≤ 15mm, tobramycin ≤ 20mm, amikacin ≤ 20mm, erythromycin ≤ 30mm. Species was identified as *N.asteroides* by the algorithm given by Kiska et al.^[3]

In spite of isolating *Nocardia spp.* the patient was not investigated for chronic granulomatous disease due to short period of admission to hospital. The patient was given 15 mg/ kg/ day of Trimethoprim and 75

mg/kg /day of Sulfamethoxazole orally. Patient was also given Imipenem. ICD was put for drainage of pus. Patient did not improve after seven days of treatment. Hence ICD drained pus was resented for microbiological examination which again grew *N.asteroides*. CT brain showed multiple (four) brain abscesses. Largest measuring 2.1 x 1.8 x 2.1 cm in right parafalcine frontal region adjacent to frontal horn of lateral ventricle.(Fig. 5). Patient worsened and finally succumbed to infection after 11 days of admission. No obvious risk factors were detected in this case.

III. Discussion

Nocardia can cause cutaneous, pulmonary and disseminated infections. Invasive and pulmonary infections mainly occur in immunocompromised host.^[1]Haematogenous dissemination may occur from the lungs to the brain, kidney, liver and all organs of the body. Suppression of cellular immunity and chronic granulomatous disease(CGD) are important risk factors for Nocardia infection.^[1] This patient had an uneventful antenatal, natal and postnatal history. Johnson et al had reported first case of *N.asteroides* in 1989 USA in 1 month old neonate. In this patient responded well to TMP-SMX.^[4]

Drug of choice for Nocardial infections is TMP-SMX parenterally or orally. In invasive cases a combination of amikacin and imipenem with cefotaxime and TMP-SMX display synergy. Immunocompetant patients with pulmonary or systemic nocardiosis should be treated for at least six months and those with CNS involvement for 12 months.

Nocardia are extremely rare as lung pathogens in neonates, but can be easily diagnosed by modified AFB stain, culture, physiological, biochemical and susceptibility testing.

Therefore, it is important to consider nocardia infection in the differential diagnosis of children disseminated infections.

References

- [1]. T.Tantracheewathorn ,S.Lolekha , S.Tantracheewathorn . Nocardia pneumonia with empyema thoracis in a healthy neonate: A case report. *Journal of Medical Associations of Thailand*, 87(4), 2007, 438 - 441.
- [2]. Koneman EW, Procop GW, Schreckenberger PC, Woods GL, Winn WC, Allen D et al. *Koneman's Color Atlas and Textbook of Diagnostic Microbiology*. 6th ed. Philadelphia; Lippincott Williams and Wilkins: 2006.
- [3]. D.Kiska ,K.Hicks , D.Pettit. Identification of Medically relevant nocardia species with an abbreviated battery of tests.*Journal of Clinical Microbiology* (4),2004,1346-1351.
- [4]. H.Johnston,A.Shigeoka , D.Hurley , T. Pysher. Nocardia pneumonia in a neonate with chronic granulomatous disease.*Paediatric Infectious DiseaseJournal*,(8),1989,526-528.

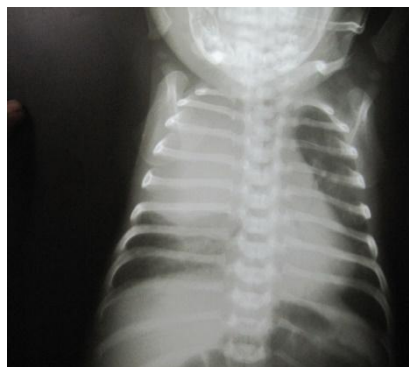


Fig.1: Xray Chest showing right sided consolidation

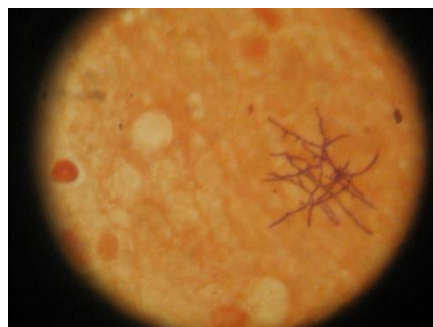


Fig.2: Gram stain showing Gram positive filaments



Fig.3: Growth on Blood agar



Fig.4: Growth on LJ medium

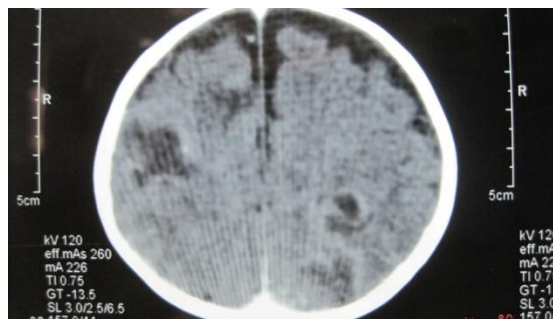


Fig.5: CT Scan showing brain abscess

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