SHORT COMMUNICATION

Penicillin resistant meningocooci causing post traumatic meningitis: A case report

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ABSTRACT

Neisseria meningitidis is a primary pathogen causing meningitis in almost all age groups. If appropriate treatment is not started early it can lead to septicaemia and death. Here we report post-traumatic meningococcal meningitis in an elderly male patient that was resistant to Penicillin.

Key words: Meningitis, *Neisseria meningitidis,* penicillin resistance

A 62-year-old male patient was admitted in the surgery ward as an alleged case of assault with a metal rod on head. He was a retired field worker in agricultural department. There was no history of any surgery, diabetes or hypertension.

On admission he had nasal bleeding, but there was no history of seizures or loss of consciousness. Patient had two lacerated wounds on either side of forehead. He was able to walk with support. Two days after admission he had sudden onset of headache, neck stiffness and fever. He was transferred to neurosurgery intensive care unit (ICU), lumbar puncture was done, cerebrospinal fluid (CSF) was drained and Cefotaxime was started in the dose of 1 g IV (Intra venous) 12th hourly.

CT scan head showed perseptal Emphysema, Pneumocephalus and Bilateral ventricular damage. CSF was turbid, cell count-2400/mm^3 with Polymorphs-82%, Lymphocytes-? RBC-8-10% and Glucose-10 g/dl, Protein>300 g/dl.

Gram stain: Pus Cells-4-6/oil immersion field. Intracellular and extracellular Gram-negative diplococci with adjacent flattened edges were seen [Figure 1].

CSF Latex agglutination was positive for *Neisseria meningitidis* Group B.

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CSF was inoculated on blood agar, chocolate agar, MacConkey agar and glucose broth.

After 24 hrs, the blood agar plate showed growth of small 1-2 mm grey translucent circular hemolytic convex colonies with a smooth glistening surface with entire edges. Culture smear showed gram negative diplococci. The colonies were catalase and oxidase positive. In serum sugars only glucose and maltose were fermented without gas production.

Agglutination with the antiserum for *N. meningitidis* Group B confirmed its identification. However antibiotic sensitivity done showed that it was resistant to Penicillin, Cotrimoxazole and Ciprofloxacin and sensitive to Erythromycin, Chloramphenicol, Rifampicin, Ceftriaxone. The Penicillin disc showed no zone around it.

As per our advice patient was started on Chloramphenicol 1.5 g i/v 12 th hourly, Ceftriaxone 1 g i/v 12 th hourly for 5 days. Features of meningitis subsided after a few days. Another CSF and blood sample received after 5 days was sterile.

All the Health care workers (HCW) and relatives who attended the patient and laboratory staff who handled the specimens were given chemoprophylaxis with a single dose of 500 mg Azithromycin orally on empty stomach. One HCW who was breast feeding had two 600 mg doses of Rifampicin.

However, the patient developed other neurological complications and died after 10 days.

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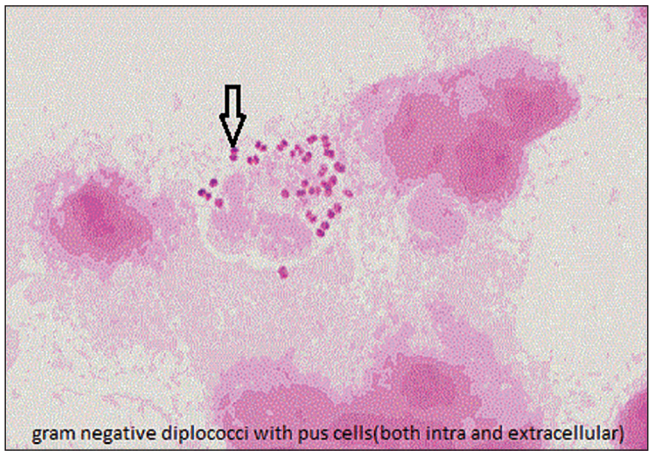

Figure 1: Gram stained smear showing Meningococccci

DISCUSSION

Meningococci are sensitive to Penicillin, Chloramphenicol, Ceftriaxone while it is resistant to sulphonamides like sulphadiazines, 1st generation cephalosporins, Cefuroxime, etc. Here in our case it is resistant to Penicillin.

First β lactamase producing meningococcal strain was isolated in 1983 at Canada. Penicillin susceptible strains have MIC <.0.06 μg/ml. The estimated incidence of moderate penicillin resistant meningococci was 0·15 per 100 000 population.[1]

Resistant strains are defined as having MIC ≥2 μg/ml. Most of the relatively resistant meningococci belong to either serogroup B or C. Diminished susceptibility in moderately resistant *N. meningitidis* strain is apparently due to decreased binding of Penicillin by altered meningococcal cell wall Penicillin binding protein (PBP 2a and PBP 3).

Though strains relatively resistant to Penicillin has emerged, high dose parenteral Penicillin remains the treatment of choice. In allergic cases oily chloramphenicol or ceftriaxone are the drugs of choice because a single dose has been shown to be effective on meningococcal meningitis. Ceftriaxone is the currently recommended parenteral regimen.[2] Meropenem is also highly active against *N. meningitidis*.

Antimicrobial susceptibility testing of *N. meningitidis* is difficult, MIC determinations are the methods of choice. Currently NCCLS recommends either broth dilution or agar dilution of MIC testing using cation supplemented Mueller-Hinton broth with 2 to 5% laked horse blood or Mueller Hinton agar with 5% (w/v), respectively. E test may also be done. Penicillin-resistant isolates should be tested for beta-lactamase with chromogenic cephalosporin test.

In our case we assume that the patient was a nasal carrier and the trauma that caused nasal bone fracture resulted in the bacterial invasion of the meninges leading to meningitis. With better facilities an MIC could have been done and the isolate gene sequenced for resistance genes. However, we report meningitis due to an unusual isolate of *N. meningitidis* resistant to Penicillin and Ampicillin by disc diffusion.

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