Case Report

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Microbiology Section

Meningitis due to *Stenotrophomonas maltophilia* after a Neurosurgical Procedure

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ABSTRACT

Stenotrophomonas maltophilia is an aerobic, glucose non- fermentative, gram negative bacillus, which is being increasingly recognized as a cause of serious infections such as bacteraemia, urinary tract infections, respiratory tract infections, skin and soft tissue infections, endocarditis, meningitis and ocular infections in hospitalized patients. The treatment of invasive *S. maltophilia* infections is difficult, as this pathogen shows high levels of intrinsic or acquired resistance to different antibiotics, thus reducing the options which are available for treatment. Meningitiscaused by *S. maltophilia* is rarely encountered and so its experience is also limited. We are describing here a case of a six months old, male child who developed meningitis caused by Stenotrophomonas maltophilia, after he underwent a neurosurgical procedure.

Key words: *Stenotrophomonas maltophilia,* Meningitis, Neurosurgery

CASE HISTORY

A six months old, male child presented to the Neurosurgery OPD of a tertiary care hospital with a progressive increase in his head size, which was disproportionate to the body length and was noticed one month back by his parents. There was no history of associated vomiting, convulsion and fever. The patient's past history revealed a previous admission to a neonatal ICU for fifty five days for respiratory distress after a preterm birth.

On the basis of examination and investigations, the patient was diagnosed as a case of congenital aqueductal stenosis with hydrocephalous. He underwent an Endoscopic Third Ventriculostomy (ETV) with aqueductal stenting. Post–operatively, the patient was shifted to the Surgical ICU on Inj. Ceftriaxone and Inj. Amikacin.

On the third day post -operatively, the patient developed fever (102.3ºF) which was associated with vomiting and a single episode of seizure .Ventricular tapping and CSF evaluation (counts and culture) were done. The CSF cell count was 2050/mm^3 (70% neutrophils and 30% lymphocytes), CSF protein was 657 mg/dl and sugar was 5 mg/dl. Inj. Meropenem substituted the antibiotics, being given empirically. However, the patient continued to be febrile, with hypertonia in limbs and occasional tonic posturing. The patient was re-operated upon, in emergency, where removal of aqueductal stent and placement of an Extra Ventricular Drain (EVD) were done. In the meantime, CSF culture grew *Pseudomonas aeruginosa* which was sensitive to Amikacin, Aztreonam, Imipenem, Meropenem and Piperacillin/Tazobactam and resistant to Ceftriaxone, Gentamycin, Ciprofloxacin, Ceftazidime and Tobramycin. On the basis of this report, Amikacin was restarted. Over the next two days, the child improved symptomatically. The EVD was kept for four days and it was then removed. After seven days, the patient developed fever again. His repeat CSF examination revealed the cell count to be 960 cells/ mm^3 (neutrophils 75%, lymphocytes 25%), total proteins to be 1318 mg/dl and glucose to be 18 mg /dl. The CSF, on culture, on Mac Conkey's agar, grew a Non-lactose fermenting oxidase negative bacillus which tested lysine decarboxylase positive, ONPG positive, was sensitive to Colistin and Polymyxin - B, hydrolyzed aesculin and reduced nitrate and was identified as *Stenotrophomonas maltophilia* on MicroScan autoScan-4 system (Siemens Healthcare). This organism was found to be sensitive to Levofloxacin and Co-trimoxazole and resistant to Ceftazidime and Ticarcillin/Clavulanate Oral Co-trimoxazole was then added to the treatment regimen. The clinical condition of the patient improved progressively and a repeat CSF evaluation which was done after seven days showed improvements in the CSF counts and a sterile culture.

DISCUSSION

Stenotrophomonas maltophilia is increasingly being recognized as an important nosocomial pathogen [1,2]. Meningitis which is caused by *S. maltophilia* is exceedingly rare and to the best of our knowledge, only 18 cases have been reported till date [2-5]. An analysis of the cases which were reported in literature, which was done, revealed that risk factors which were associated with *S. maltophilia* infection were prematurity, neurosurgical procedures (especially shunts and drainages), intra–cranial haemorrhages and malignancies. Carbapenem treatment has also been suggested as a risk factor for infection/colonization with *S. maltophilia* [6].

Risk factors for our patient were parallel to those which have been reported in literature. This patient underwent a neurosurgical procedure for his congenital anomaly, followed by placement of an extra-ventricular drain and also importantly, he was treated with Meropenem for 10 days. Including the current case, all patients who underwent neurosurgeries which were associated with *S. maltophilia* meningitis, presented with fever.

Resistance to multiple agents which are used to treat gram negative infections is a hallmark of *S. maltophilia* [7]. Inducible its beta lactamse activity (including L1 metallo-β-lactamse and L2 serine-β-lactamse), an efflux mechanism, an aminoglycoside modifying enzyme activity, biofilm formation and production of extracellular slime or glycocalcyx are responsible for its resistance [8].

TMP-SMX is regarded as the therapy of choice for *S. maltophilia* infection, based on the in-vitro susceptibility data which confirm its high activity and favourable outcomes, which are observed in patients who are treated with this agent [1]. Ciprofloxacin, Ceftazidime or Ceftriaxone and Ticarcillin/clavulanate, alone or in combination with other antibiotics, may be considered as alternative options other than Co-trimoxazole. Clinical success rates after the administration of these alternatives ranged from 66.7-85% among the limited number of cases which were reported [9].

CONCLUSION

S. maltophilia is an emerging pathogen which causes nosocomial infections. It should be considered as a potential cause of meningitis that develops after a neurosurgical procedure in patients who are on long term, broad spectrum antibiotics.

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