Acinetobacter - An Emerging Meningitis causing Pathogen in North India

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ABSTRACT

Background: Acinetobacter is a key source of infection in debilitated patients in the hospital. They act as opportunistic pathogens causing respiratory tract infections like pneumonia, bronchitis etc. Sometimes they may be encountered in serious infections including meningitis, septicemia and endocarditis. There is a paucity of data on contribution of Acinetobacter in causation of meningitis.

Material and Methods: Present study was conducted over a period of four years w.e.f. January 2005 to December 2008, a total of 3177 CSF samples were tested from patients suspected of having a meningitis. Out of 73 positive samples, Acinetobacter had a prevalence of 26.03% (19/73). Imipenem and gatifloxacin showed 100% sensitivity whereas ampicillin, cotrimoxazole, ciprofloxacin and cephaloridine gave very poor response. Increasing prevalence of Acinetobacter meningitis, inclining antibiotic resistance and emergence of multidrug resistant strains call for immediate line of action.

Conclusion: Hence, periodic preparation of antibiograms for the selection of appropriate antimicrobial drug combined with effective infection control measures in the hospital, especially in the ICU's, are very important to save the precious lives. (*J Med Sci* 2009; 12(1):24-26)

Key words: Acinetobacter, Meningitis, Imipenem, Gatiflox.

Observations

Acinetobacter species are generally considered nonpathogenic to healthy individuals. These are found with carriage rates of 42.5% in healthy individuals and as high as 75% in hospitalized patients.¹ They act as opportunistic pathogens causing respiratory tract infections like pneumonia, bronchitis etc. Sometimes they may be encountered in serious infections including meningitis, septicemia and endocarditis. Acinetobacter is a key source of infection in debilitated patients in the

hospital.² Due to the paucity of data in this part of the country, a study was planned to know the prevalence of this threatening microorganism in meningitis.

Materials and Methods

Three thousand one hundred and 77 CSF samples received from patients suspected of having meningitis, were cultured in the department of Microbiology, for a period of 4 years from January 2005 to December, 2008.

Each CSF sample was divided into two parts. One part was used for cytology and second part was centrifuged. The deposit obtained was cultured on blood agar, blood agar with Staphylococcus aureus streak, chocolate agar, and MacCopnkey agar plates. Blood agar with Staphylococcus aureus streak and chocolate agar plates

Reprint Request:

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were incubated under capnophilic condition in a candle jar. Incubation was done for 24 hours at 37°C, and it was extended for another 24 hours if no growth appeared on day one. Bacterial growth was identified based on the colony characteristics, Gram stain and biochemical tests.³

The colonies of *Acinetobacter* were whitish or cream coloured, smooth, circular and glistening. The antibiotic susceptibility was done by Kirby-Bauer disc diffusion method.⁴

Results

Acinetobacter was isolated from 19(26.03%) out of the 73 culture positive specimens of CSF. Results are indicated in Table 1. Out of the positive cases, 2 were children aged 2 and 5 years, there were 10 females and 9 males.

Table 1: Year-wise analysis of acinetobacter isolations from CSF

Year	Total samples	No. of positive samples	No. of <i>Acinetobacter</i>	Percentage
2005	958	11	01	09.09
2006	465	15	02	13.33
2007	821	26	11	42.31
2008	935	21	05	24.81
Total	3177	73	19	26.03

Other pathogens isolated from the positive samples included *Pneumococcus*, *Pseudomonas*, *Neisseria*, *Escherichia coli*, *Haemophilus influenzae*, *Staphylococcus aureus* and *Klebsiella pneumoniae* in declining order of frequency (Table 2). Cytology showed white cells between the ranges of 440-25000/cu.mm in these nineteen cases. The isolates were found to be 100% sensitive to imipenem, gatifloxacin and piperacillin tazobactam combination. These were found to be 100% resistant to ampicillin, cephaloridine cefuroxime, ceftazidime ciprofloxacin and amoxicillin/clavulanic acid combination. Cefoperazone sulbactam combination revealed the sensitivity to be 89.47%. Results are shown in Table 2.

Discussion

Acinetobacter is a common commensal of skin and also a saprophyte. Sometimes it causes disease like urinary tract infection, hypotension, hemorrhagic adrenals and Frederickson syndrome. It is often associated with hospital infections particularly iatrogenic meningitis.⁵ The disease has been reported from time to time, although with a low incidence. Earlier studies conducted in the same region reported 5.6% and 9.2% of meningitis caused by *Acinetobacter*.^{6,7} By comparing the results of these two studies conducted in the same region,

Table 2: Antimicrobial susceptibility pattern of 19 *Acinetobacter* isolates

Antibiotic	Disc potency Mmg/disc	No. of sensitive isolates	% sensitivity	% of resistance
Ampicillin	10	00	00.00	100.00
Cephloridine	30	00	00.00	100.00
Cefuroxime	10	00	00.00	100.00
Ceftazidime	30	00	00.00	100.00
Cefoperazone	75	03	15.78	84.22
Ceftriaxone	30	03	15.78	84.00
Cotrimoxazole	25	01	05.26	94.74
Gentamicin	10	03	15.78	84.22
Amikacin	30	07	36.84	63.16
Chloramphenicol	30	11	57.89	42.11
Imipenem	10	19	100.00	00.00
Gatiflox	30	19	100.00	00
Ciprofloxacin	05	00	00.00	100.00
Ofloxacin	30	20	52.63	47.37
Cefoperazone/sulbactam	30	17	89.47	10.53
Piperacillin/tazobactam	30	19	100.00	00.00
Tetracycline	30	08	42.10	58.90
Amoxycillin/clavulanic acid	30	00	0.00	100.00

we can conclude that there is almost three to five fold increase in the prevalence of *Acinetobacter* meningitis.

Acinetobacter species are innately resistant to many classes of antibiotics. Earlier studies in the region found high degree of resistance to commonly used drugs.^{6,7} Present study also showed marked resistance to ampicillin, cotrimoxazole, tetracycline, ciprofloxacin, cephaloridine, aminoglycosides and amoxicillin/clavulanic acid combination. Multi drug resistance in this organism is also reported increasing frequently.⁸ Resistance to fluoroquinolones has been reported during therapy and this has also resulted in increased resistance to other drug classes mediated through active drug efflux. A dramatic increase in antibiotic resistance in *Acinetobacter* strains has been reported by the CDC and the carbapenems are recognized as the gold-standard and treatment of last resort.⁹ Imipenem/meropenem remains the drug of choice of treating *Acinetobacter* infections. In our study also, we found imipenem to be 100% sensitive. *Acinetobacter* species are developing resistant to many classes of antibiotics.

The aim of the study is to create general awareness regarding increasing pathogenic behavior of *Acinetobacter* that was earlier labeled as commensal. Secondly, it should not be confused with *N.meningitis* which

resembles it morphologically. Clinically, the disease produced remains indistinguishable from that produced by other pathogens. It exhibits a wide and varied spectrum of antibiotic sensitivity. Variety of potential sources of contamination and infection in the hospital environment promote the spread of resistant Acinetobacter in nosocomial infections. Hence periodic preparation of antibiograms for the selection of appropriate antimicrobial drug combined with effective infection control measures in the hospital, especially in the ICU's are very important to save precious lives.

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