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Acinetobacter species as pathogens in tertiary care hospital - A retrospective study

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ABSTRACT: *Acinetobacter* species are gaining importance in the present days. Here we report isolation of 149 isolates of *Acinetobacter* species from various clinical samples from the intensive units of our hospital. We used standard microbiological techniques to identify the isolates and antibiotic sensitivity testing was done by using Kirby-Bauer disc diffusion technique. *A.baumanii* was the commonest organism in our study and was found multi drug resistant.

Key words: *Acinatobacter, A.baumanii, A.haemolyticus*

Introduction

The identity of genus *Acinetobacter* ambiguous for many years and was earlier classified under different genera. The newer techniques resolved the confusion in identification and classification of these organisms.[1] These techniques include phenotypic and DNA-DNA hybridization techniques. But these techniques are cumbersome and time consuming. [2] These organisms were once considered as contaminants in clinical laboratories however, now they are considered as important nosocomial pathogens. They are known to cause different kinds of opportunistic infections.[2, 3] They are non fermentative aerobic gram negative rods, which are ubiquitous in nature and are also commonly found on the normal human flora.[4] These organisms have tremendous colonizing capability, especially in hospitalized patients. [5]

The role of the newer pathogens has now been recognized especially in neonates and cancer patients and also in patients admitted in intensive units. [6, 7, 8, 9] This is because of the ubiquitous nature of the organisms and their colonizing capacity on diagnostic and therapeutic ICU settings. [2] Despite of the increasing significance and frequency of multiple drug resistant Acinetobacter infections, many clinicians still lack an appreciation of the potential importance of these organisms in hospitals. The present study was undertaken to determine the prevalence of Acinetobacter species and their antibiotic sensitivity pattern in patients of our hospital.

Material and Methods

The present study was conducted in the Microbiology laboratory of our Hospital during the period of Jan – Dec 2005. A total of 6989 clinical samples from patients admitted in the hospital were received for bacteriological study. The samples were processed as per the standard Microbiological methods. Non lactose fermenting colonies on Mac Conkey's medium were tested for oxidase test, catalase and motility by hanging drop. The isolates which were oxidase negative, catalase positive and non motile were considered as Acinetobacter species and were further processed for species level identification (Table No 1). Antibiotic sensitivity of these isolates was performed by using Kirby Baeur disc diffusion method on Muller Hinton Agar.

Table No.1 showing the biochemical reactions used for identifying the Acinetobacter species

Organisms	Nitrate reduction	Growth at		Haemolysis -Blood agar.	O/F of 10% glucose	Arginine hydrolysis
		37^0	44^0			
A.baumanii	Negative	Positive	Positive	Negative	Positive	Positive
A.haemolyticus	Negative	Positive	Negative	Positive	Variable	Positive
A.calcoaciticus.	Negative	Positive	Negative	Negative	Positive	Negative

Results

From 6989 samples, 149 (2.13%) yielded *Acinetobacter* species. Table 2, summarizes the source of different clinical materials and Table No.3 shows the distribution of Acinetobacter isolates from patients admitted in different wards of the hospital. Of the 149 *Acinetobacter* isolates, 68 (45.63%) were *A. baumanii,* 43 (28.85 %) *A. calcoaceticus* and 21 (14.09%) *A.haemolyticus*. Seventeen isoaltes could not be identified up to species level.

The antibiotic sensitivity results revealed that, 87 (58.39%) of the isolates were resistant to Ciprofloxacin, Cefotaxime, Ofloxacin and Amikacin. Twenty (14.42%) isoaltes were resistant to Ceftazidime and Ciprofloxacin in combination and ten (6.71 %) to Ciprofloxacin and-Ofloxacin.

Table No.2. Number of samples showing isolation of Acinetobacter species

Sl. No.	Samples.	Number (%)
1	Blood	37 (24.83)
2	Pus	39 (26.17)
3	ET tip	19 (12.75)
4	Urine	18 (12.08)
5	Central line tip	05 (3.35)
6	Suction tip	05 (3.35)
7	Cervical swab	05 (3.35)
8	Tracheal secretions	03 (2.01)
9	Eye swab	03 (2.01)
10	others	15 (10.06)
Total		149

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Table: 3 Distribution of isolates in the wards

Sl. No	Ward	No (%)
1	NICU	43 (28.85)
2	MICU	29 (19.46)
3	PICU	20 (13.42)
4	Burns ward	15 (10.06)
5	Gen Ward	13 (8.72)
6	NSICU	08 (5.36)
7	ITU	08 (5.36)
8	SICU	08 (5.36)
9	Paed ward	05 (3.35)
Total		149

Discussion

The isolation of *Acinetobacter* species from clinical samples had less significance and were regarded as mere contaminants in the past and hence, further characterization was deemed unnecessary. [1, 10] In the recent times it is known that these organisms can cause various clinical and nosocomial infections. [11] The isoaltes in the present study were from the patients admitted in intensive care units (ICU/PICU/SICU/MICU) suffering from various clinical infections.

During the routine environmental surveillance cultures we did not isolate any Acinetobacter species from exposed Petri plates and no clustering of the cases were observed. This proves that probably organisms were not from hospital environment. However, Gulati S., et. al., isolated these organisms from hospital environment as well as from clinical samples. These authors have also proved them to be the nosocomial pathogens. [1]

Prashant K et. al., have isolated 48.8% of *Acinetobacter* species from respiratory infections, 16.27% from blood stream infections, 9.3% from urine and the rest from other samples.[12] But in our study the major isolates are from pus (26.17%), blood (24.83%), respiratory samples (i.e. ET tip, Suction tip & Tracheal aspirations) (18.11%) and in urine (12.08%). This variation between the studies may be because of severity of patients admitted and also number of the samples received at our laboratory. *A. baumanii* was the most common clinical isolate in most of the studies and was reported to be associated with invasive infections and in immunosuppressive patients. [9,12,13] We have found that *A.baumanii* (45.63%) as a major isolate in our study. Seventeen isolates of our study could not be speciated, because of certain limitations as the methods we used and they have some inherited limitations. These isolates may be belonged to any of the species if we have used extensive biochemical tests or DNA-DNA hybridization methods. [1]

With simple biochemical tests, we presumptively identified and speciated *Acinetobacter* organisms by using hemolysis on blood agar, Nitrate reduction test, growth at 37^0 C and 44^0C acid production from glucose and arginine hydrolysis. As mentioned by Gulati S et. al., it may not be possible for every microbiology laboCratory to identify these organisms to genospecies level because these laboratories are not commonly carrying out molecular methods or extensive carbohydrate assimilation tests as a routine exercise. [1]

In conclusion, *A. baumanii* was the commonest species responsible for majority of *Acinetobacter* in our hospital. Multi-drug resistant Acinetobacter species from high risk areas can cause severe life threatening infections despite of them not being present in such environments. If these organisms isolated from intensive units, microbiologist should report them as a pathogen and he/she should also monitor the routine environmental surveillance cultures in these areas to identify as these organisms are known to be present in hospital environment.

References

1. Gulati S, Kapil A, Goel V, Das B,et.al. Biotyping of Acinetobacter species isolated from clinical samples. Indian J Med Res. 1999 ;110:160-3
2. Bergogne-Bérézin E, Towner KJ. Acinetobacter spp. as nosocomial pathogens: microbiological, clinical, and epidemiological features. Clin Microbiol Rev. 1996 ;9 (2) : 148 - 65.
3. Prashanth K, Badrinath S. Nosocomial infections due to Acinetobacter species: Clinical findings, risk and prognostic factors. Indian J Med Microbiol. 2006; 24(1):39-44.
4. Taplin D, Zaias N. The human skin as a source of Mima – Herellea infections. JAMA. 1963; 7;186 :952-5.
5. Patil JR, Jog NR, Chopade BA. Isolation and characterization of Acinatobacter species from upper respiratory tract of healthy humans and demonstration of lectin activity. Indian J Med Microbiol 2001 : 19 (1) : 30 – 35
6. Suri A, Mahapatra AK, Kapil A. Acinatobacter infection in neurosurgical intensive care patients. Natl Med J India. 2000 : 13 : 296 – 300
7. Christo GG, Shenoy V, Mathai J, Shivananda PG, Ventaktesh A. Acinatobacter species in Neonates. Ind Paed. 1993 : 30 : 1413 – 1416
8. Mittal J, Nair D, Gupta N, Rawat D, Kabra S, et.al. Out-break of Acinetobacter species septicemia in a neonatal ICU. Southeast Asian J Trop Med Public Health 2003 : 34 : 365 – 366
9. Tilley PA, Roberts FJ. Bacteremia with Acinatobacter species, Risk factors and prognosis in different clinical settings. Clin Infect Dis 1994 : 18 : 896 – 900
10. Lortholary O, Fagon JY, Hoi AB, et.al. Nasocomial acquisition of multi-drug resistant A. baumanii risk factors and prognosis. Clin Infect Dis 1995 : 20(4) : 790 – 796
11. D'Aata EM, Thayer V, Schffner W. An outbreak of Acinetobacter baumanii. The importance of cross contamination. Infect Control Hosp Epidemoiol.2000; 21:588-91.
12. Prashant K, Badrinath S. In-vitro susceptibility of Acinetobacter species to commonly used cephalosporins, quinolones and amino glycosides. Indian J Med Micro.2004:22 (2):97-103.
13. Weaver RE, Actis LA. Identification of Acinetobacter species. J Clin.Micro.1994;32(7);1833.