

Antimicrobial Susceptibility Pattern of Common Bacterial Pathogens in Nashik , Maharashtra.



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Introduction

Antibiotics and similar drugs together called as Antimicrobial agents have been used for the last 70 years to treat infectious diseases. Use of antibiotics to patients has been beneficial if prescribed and administered correctly. However, these drugs have been used so widely and for longer period that the microorganisms have developed resistance to them. The emergences of multi drug resistant strains of many microorganisms have developed life threatening sepsis, endocarditis and osteomyelitis in many patients.(1) Detection of antibiotic resistance and prescription of suitable antibiotics is of paramount importance. The present study has been carried out to detect the antibiotic resistance amongst common bacterial pathogens isolated from various clinical samples. This information can be used formulate awareness program for users of antibiotics to decide policy on use of various antibiotics.

Key words: Antibiotic, Infectious disease, Resistance, Sepsis.

Materials and Methods

A total of 205 various clinical samples such as urine, pus, endowash, sputum, blood etc. were collected from various clinical pathological laboratories in Nashik city.

The samples were cultured on Nutrient agar, MacConkey's agar and Blood agar plates and incubated aerobically at 37°C for 18-24 hrs. The isolates were identified using morphological and standard biochemical tests like Enzyme detection tests, IMViC, Sugar utilization tests etc.(2,3) Antibiotic sensitivity testing was performed by Kirby-Bauer disc diffusion method against Cephalosporine(15mgm), Penicillin(10units), Imipenem(10mgm), Gentamycine(10mgm), Ciprofloxacin(5mgm), Tobramycine(10mgm), Moxifloxacin(5mgm), Ofloxacin(5mgm), Sparfloxacin(5mgm), Levofloxacin(5mgm).

Discs of above antibiotics were placed on previously seeded 0.5 McFarland bacterial suspension of isolated pathogen, followed by overnight incubation at 37°C. Zone of inhibitions were noted and sensitive, intermediate and resistant pattern was determined on the basis of CLSI standards.(4)

Results and Discussion:

The pathogens isolated from various clinical samples are detailed in table no. 1

It is observed that the semen, pleural fluid, biopsy material, breast milk, bronchial fluid and catheter tip harbors less pathogens as compared to other clinical samples such as urine, pus, endowash sputum etc.%

Table No.1 Isolation and identification of Bacterial pathogens from various clinical samples

Organism	Urine	Pus	Endo wash	Blood	Swab	Sputum	Stool	Semen	Pleural Fluid	Biopsy Material	Breast Milk	Bronchial fluid	Catheter tip	Total
<i>Staphylococcus</i>	10	11	20	5	9	3	0	4	0	2	0	0	0	64
<i>Escherichia</i>	18	1	2	1	2	3	13	3	0	0	1	0	0	44
<i>Acinetobacter</i>	3	8	1	0	0	2	0	0	0	0	0	0	0	14
<i>Streptococcus</i>	4	2	6	0	3	5	0	1	0	0	0	0	0	21
<i>Pseudomonas</i>	5	8	1	0	5	4	1	0	3	0	1	0	0	28
<i>Shigella</i>	0	0	0	0	0	0	11	0	0	0	0	0	0	11
<i>Salmonella</i>	1	0	0	4	0	0	4	0	0	0	0	0	0	9
<i>Citrobacter</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	2
<i>Klebsiella</i>	3	5	0	0	0	4	0	0	0	0	0	5	0	17
<i>Proteus</i>	1	1	0	0	0	0	0	0	0	0	0	0	2	4
<i>Micrococcus</i>	0	2	0	0	0	0	0	0	0	0	0	2	0	4
<i>Enterococcus</i>	0	1	0	0	2	2	0	0	0	0	0	0	0	5
Total	46	38	30	10	19	23	29	8	3	2	2	7	2	221

Table No.2: % resistance to various antibiotics by clinical isolates

Organism	Cephalosporine	Penicillin	Imepenem	Gentamycine	Ciprofloxacin	Tobramycine	Moxifloxacin	Ofloxacin	Sparfloxacin	Levofloxacin
<i>Staphylococcus</i>	61	72	30	48	35	49	52	49	38	38
<i>Escherichia</i>	92	52	45	48	33	45	32	23	13	23
<i>Acinetobacter</i>	57	54	64	67	78	55	43	34	44	33
<i>Streptococcus</i>	43	43	54	44	31	41	32	31	28	21
<i>Pseudomonas</i>	28	37	45	56	63	39	30	32	21	21
<i>Shigella</i>	21	12	19	15	11	20	16	11	09	13
<i>Salmonella</i>	24	20	17	19	21	24	18	13	11	13
<i>Citrobacter</i>	09	11	23	16	11	17	11	11	07	09
<i>Klebsiella</i>	28	19	21	23	13	28	12	15	12	17
<i>Proteus</i>	11	16	09	21	21	18	15	12	11	10
<i>Micrococcus</i>	23	34	12	31	19	30	23	21	24	10
<i>Enterococcus</i>	12	25	33	14	13	21	21	10	08	07

resistance of isolates to selected antibiotics is detailed in table no. 2 The prevalence rate of antibiotic resistance by various bacterial pathogens was found to be 59.8%, which is more than the reports from investigations in India(32.8%) . A study from Maharashtra state in India has reported more than 90% isolates of Staph. aureus are multi drug resistant.(7) The antibiotic resistant pattern over different parts of India is not uniform. Reports from Delhi hospital showed a prevalence rate of 51.8% in 2001, whereas it was reported as 38.44% in the same hospital in 2008.(5) Another study from north India has reported an incidence comparable to our study.(6)

The study showed that 72% strains of Staphylococcus were resistant to Penicillin, 61% to cephalosporine,30% to Imipenem. 92% E.coli iso-

lates were resistant to cephalosporine, 28% Klebsiella to cephalosporine and Tobramycine. 78% strains of Pseudomonas and almost all Acinetobacter strains were resistant to almost all antibiotics. Proteus and Salmonella had also developed resistance than other isolates.

It also shows that the common bacterial pathogens are developing resistance to antibiotics, a serious concern need to be taken by users while prescribing and consuming dose of antibiotics. Improper use of antibiotics, counter sale of drugs, malpractices and incomplete consumption of dose by patients might be few reasons other than genetic changes in micro-organisms for development of resistance against antibiotics. A policy of use of antibiotics should be prepared by concerned authorities for proper use of antibiotics as there is restricted range of antibiotics is available.

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