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Pattern of Antibiotic Resistance Bacteria Isolated From Various Clinical Specimens

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Abstract:
Introduction:
Although progress has been made to eradicate or control many infectious diseases, humankind remains vulnerable to a wide array of new and resurgent organisms. The outcome of any infection depends on the virulence of infectious agents, the number of organisms in infecting inoculum and the response of the immune system of the host.
Materials and Methods:
This is a retrospective descriptive study done in Lifecare Diagnostics and Research Centre for three years (2015-2017). Specimens of different pattern like blood, pus and urine were studied. Total specimens were 563. Urine specimens were 418, blood specimens were 48 and Pus 97. Before starting this study, we have taken ethical clearance from the institution.
Results:
This study shows most common organism cultured in urine specimen is E. coliand most sensitive antibiotic is Amikacin. Similarly, in Pus culture is Staphylococcus aureus and most sensitive antibiotic is Vancomycin and in blood culture the organism was Staphylococcus aureus and Enterococcus spp and the most sensitive antibiotic is Vancomycin and Ampicilin.
Conclusion:
Regular surveillance of different types of organisms and sensitivity to different types of drugs should be carried out for the treatment of the patient scientifically.

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I. Introduction:

Infection is the invasion of an organism's body tissues by disease causing agents, their multiplication, and the reaction of host tissues to the infectious agents and the toxins they produce. Pathogenic bacteria are those bacteria that can cause disease. Although, most bacteria are harmless or often beneficial, with the number of species estimated as fewer than 100 that are seen to cause infectious diseases. Your immune system protects you against infectious agents. You can prevent infection through simple tactics, such as washing your hands regularly, being careful with food and water, getting vaccination, and taking appropriate medications, covering cough and sneezes using gloves and masks and protective clothing and following hospital guidelines when dealing with blood or contaminated items.

Although progress has been made to eradicate or control many infectious diseases, humankind remains vulnerable to a wide array of new and resurgent organisms. The outcome of any infection depends on the virulence of infectious agents, the number of organisms in infecting inoculum and the response of the immune system of the host.

II. Materials and Methods:

This is a retrospective descriptive study done in Lifecare Diagnostics and Research Centre, Pokhara Nepal for three years (2015-2017). Specimens of different pattern like blood, pus and urine were studied. Total specimens were 563. Urine specimens were 418, blood specimens were 48 and Pus 97. Before starting this study, we have taken ethical clearance from the institution. We used CLED (Cysteine-Lactose-, and electrolyte deficient) agar media for urine culture, BACTEC (Bactenecin) for blood culture and Blood agar and chocolate agar for pus culture. Similarly, for the Drug Sensitivity test, antibiotic discused for different antibiotics, like, Amikacin, Azithromycin, Gentamycin, Amoxicillin, Ofloxacin, Cefexime, Ceftriaxone, Ciprofloxacin,

Levofloxacin, Norfloxacin, Cefotaxime, Ceftazidime, Cotrimoxazole, Vancomycin, Clindamycin, Ampicillin. We kept specimens for 3 days in an incubator for growth of organism. If we found growth, then we keep antibiotic discs for Antibiotic Sensitivity Test.

III. Results:

This study shows most common organism cultured in urine specimen is *E. coli*(62.24%)and most sensitive antibiotic is Amikacin. Similarly, in Pus culture is *Staphylococcus aureus* and most sensitive antibiotic is Vancomycin and in blood culture the organism was *Staphylococcus aureus* and *Enterococcus spp* and the most sensitive antibiotic is Vancomycin and Ampicillin.

In urine culture, the other organisms grown were *Klebsiella spp*(19.38%), *Proteus spp*(9.18%) and *Pseudomonas spp* (9.18%). Similarly, in Pus culture, the grown organism found *Staphylococcus aureus*(24.74%) and in Blood culture, organism grown was *Staphylococcus aureus* and *Enterococcus faecalis* (4.16%). The most sensitive drugs for bacteria grown in urine culture are Amikacin (96.07%), Gentamycin (91.39%) Nitrofurantoin (83.33%) Ciprofloxacin (39.50%) and the most resistant drug was Cefixime (67.60%) Ceftriaxone (72.88%), Ofloxacin (54.09%) and Ciprofloxacin (44.44%).

In Pus culture, the most sensitive drug for the bacteria grown in pus culture was Vancomycin (84.21%); Gentamycin (81.25%), Cotrimoxazole (60.0%) and the most resistant drug was Amoxicillin (64.28%) and Ceftazidime (63.63%).

In blood culture, the most sensitive drug was Vancomycin for *Enterococcus faecalis* and Ampicillin for *Staphylococcus aureus.*

Table no. 1: Table showing sex distribution

Total number of specimens	Male	Female
563 (100 %)	243 (43.16 %)	320 (56.83 %)

Table.no. 2: Table showing growth of organisms.

Total number of specimens	Growth of Organisms	No growth
563 (100 %)2	124 (22.02%)	439 (77.97 %)

Table no. 3: Table showing growth of organisms in various specimens.

	Type of specimens	Number of specimens	Percentage of Growth
1.	Urine	418	(98) 23.44 %
2.	Blood	48	(2) 4.16 %
3.	Pus	97	(24) 24.74 %

Table no. 4: Table showing Antibiotic Sensitivity against various organisms.

	Type of specimens	Growth of Organisms	Sensitivity of antibiotics
1.	Urine	*E.Coli*/ *proteus* spp / *Klebsiella* spp	Amikacin Nitrofurantoin Gentamycin
2.	Blood	*Staphylococcus aureus/* *Enterococcus faecalis*	Vancomycin Ampicillin
3.	Pus	*Staphylococcus aureus*	Vancomycin Cotrimoxazole

IV. Discussion:

Resistance to antibiotics is an extremely serious threat to patient care all over the world. Rapidly rising antibiotic resistance is a challenge to comprehensive patient care in all branches of medical science. The interaction between various clinical bacteria and the antimicrobial agents is a complex issue involving the prokaryotic adaptive mechanisms and genetic changes. Judicioususe of antibiotics and frequent surveillance are needed to curb this threat and preserve the antibiotics for the future[1].

Appropriate antimicrobial therapy may reduce the potential for the complication choice of appropriate antibiotics depends on the knowledge of common organisms and their antimicrobial susceptibility pattern in local scenario[2].

Knowledge about local microbiological pattern is essential for rationalizing both prophylaxis and treatment regimens. Availability of antibiotics easily without doctor's prescription over the counter is one of the major causes for developing antibiotic resistance in developing countries[3].

The effectiveness of currently available antibiotics is decreasing as a result of increasing resistant strains among clinical isolates; emergence of antimicrobial resistance is a major public health problem worldwide, particularly in developing countries. Increased use of empirical therapy, self-antibiotic prescription, lack of clinical microbiology laboratories to identify the specific etiologic agents and their antimicrobial susceptibility, lack of access to local antibiogram data and poor awareness of prescriber about antimicrobial resistance, were the leading local factors for development of antimicrobial resistance. Antimicrobial resistance profile of bacteria varies among population because of difference in geography; local antimicrobial prescribing practices and prevalence of resistant bacterial species such as differences are never stable and may change rapidly especially in places where misuse of antibiotics are common particularly in developing countries[4].

A rise in bacterial resistance to antibiotics complicates treatment of infections. In general, up-to 95% of cases with severe symptoms is treated without bacteriological investigations[5].

Determination of antibiotic sensitivity patterns in periodic intervals is mandatory in each region for choosing appropriate antibiotic therapy, safe and effective empirical therapies and develops rational prescription programs[6].

V. Conclusion:

Bacterial profile and drug sensitivity is always changing. Infection mostly depends upon virulence, colonization and biofilm formation of the micro-organisms and immunity of the individual person. Timely, study should be carried out in regular interval of the micro-organism found in that area and drug sensitivity pattern for that period. It will help to start empirical therapy scientifically.

References:

[1]. Rudrajit Paul, Jayanti Ray, Sourav Sinha, Jayati Mondal; Antibiotic resistance pattern of bacteria isolated from various clinicalspecimens: an eastern Indian study;International Journal of Community Medicine and Public Health.*Paul R et al. Int J Community Med Public Health. 2017 Apr;4(4):1367-137.*

[2]. Saroj Kumar Sah, Shobha Regmi , Anup Raj Upreti, Shiva Pathak;Antibiotic resistance patterns and evaluation of treatment In out-patients with urinary tract infections in Nepal.International Journal of Pharmaceutical Sciences, *Sah et al., IJPSR, 2016; Vol. 7(11): 4626-4631.* E-ISSN: 0975-8232; P-ISSN: 2320-5148, IJPSR (2016), Vol. 7, Issue 11.

[3]. Rijal A, Ghimire G, Gautam K, Barakoti A;Antibiotic Susceptibility of Organisms Causing Urinary Tract Infection in Patients Presenting to a Teaching Hospital,J Nepal Health Res Counc 2012 Jan;10(20):24-7.

[4]. Karki S, Rai GK, Manandhar R; Bacteriological Analysis and Antibiotic Sensitivity Pattern of Blood Culture Isolates in Kanti Children Hospital. J. Nepal Paediatr. Soc. May-August, 2010/Vol 30/Issue 2.

[5]. R Gautam, M L Chapagain, A Acharya, N Rayamajhi, S Shrestha, S Ansari, G Upadhaya and HP Nepal; Antimicrobial susceptibility patterns of Escherichia coli from various clinical sources.Journal of Chitwan Medical College 2013; 3(3): 14-17.

[6]. Anteneh Amsalu, Zeleke Geto, Demissie Asegu and Setegn Eshetie.Antimicrobial resistance pattern of bacterial isolatesfrom different clinical specimens in Southern Ethiopia:A three year retrospective study. Afr. J. Bacteriol. Res. Vol. 9(1), pp. 1-8, January 2017, ISSN 2006-9871.

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