

## MICROBIOLOGICAL ISOLATES IN BODY FLUIDS AND SECRETIONS

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### ABSTRACT

#### Objective:

To assess the spectrum of microbes isolated from body fluids and secretions

#### Material & Methods:

It is a Descriptive: Observational study which was carried out from January 2010 at Taj Medical Complex Karachi. Pakistan. A total of three thousand and fifty six (3056) samples received in the laboratory of the Taj Medical Complex (both from indoor as well as outdoor patients) were included from both sexes satisfying the inclusion criteria.

#### Results:

Included patients had a mean age of 40.5 years with female predominance. Nearly a third of included samples yielded any growth by microbial agents. Most commonly isolated pathogen was *Klebsiella* spp. followed by the *Escherichia coli* and *Staphylococcus* spp.

#### Conclusion:

The regular and meticulous monitoring of the pattern & distribution of microbial isolates can guide our choices in terms of empirical antibiotic therapies. Our study is a snapshot of the current microbiological occurrence.

#### Keywords:

*Escherichia coli*, *Shigella*, *Salmonella typhi*, *Klebsiella* spp, *Proteus* spp., *pseudomonas*, *Vibrio cholera*, *Staphylococcus* spp, *Streptococcus pneumoniae*, *Enterococci*, *Enterobacter*, *Candida* spp. Yeast cells, Microbes, Body fluids, Body secretions.

### INTRODUCTION

All healthcare professionals come across diseases of infective etiology and daily practice. It is not rare for them to rely on empirical treatment strategies due to a multitude of limitations regarding availability and / or access to sensitivity information regarding the pathogens. In such dire circumstances there is a dire need for continuous availability of information to physicians regarding the pathogens implicated in different microbiological specimens to enable give them some help in at least choosing the most likely empirical therapy when they are otherwise blinded by either lack of facilities or cost issues in our setup. Fortunately in many cases, the infections which usually cause a febrile illness are self limiting. Presumed viral in most case: but 5-10% of febrile children shows a serious bacterial infection. 1-3 therefore the importance of initiating empirical therapy in areas lacking access to microbiological testing cannot be over emphasized. This can only be achieved when continuous surveillance of the occurrence of likely pathogens is conducted regularly. Such conditions which cannot be distinguished without certainty from viral infections in the absence of microbiological help are dangerous for patients in general and at extremes of age in particular. The consequences of a delayed or missed diagnosis can be serious and, occasionally, fatal. The list of pathogens seems to be infinite, however some are more common and likely to be present in a particular subset of population or geographic region, information regarding this can only be sought by regular monitoring thus we embarked on this study to ascertain the pattern of microbial isolates which can help focus resources, both in terms of the choice of empirical therapies in area where specialized facilities

aren't available. We endeavored to obtain the benchmark data upon which future studies can be conducted to enable focused sensitivity testing and guide clinicians in making empirical choices in the absence of critical microbiological help.

## MATERIAL AND METHODS

We strived to assess the spectrum of microbes isolated from body fluids and secretions in this Descriptive Observational study which was conducted at Taj Medical Complex in Karachi. Microbiology report's records were retrieved from the laboratory database using Laboratory Information Management Software (LIMS) for the entire year of 2011. Consecutive non-probability sampling procedure was employed. The sample size was calculated with a p value at 0.05 from the latest reported frequency of the least encountered pathogen in similar samples. The inclusion criteria included samples received in sterile containers for culture studies and/ or culture & sensitivity studies from patients belonging to both sexes between the ages of 1-80 years (coded as blood, cerebrospinal fluid, pus, urine, sputum and pleural fluid). Special care was instituted to exclude blood samples drawn after onset of an antimicrobial therapy to avoid aberrant results. Data was input into Microsoft Excel sheets version 2003 and was subsequently exported to the Statistical Package for Social Sciences (SPSS) ver-

sion 10.0. where it was analyzed and results were drawn from the data. Descriptive variables like age and gender were expressed as percentages whereas the pattern of the microbial isolates was expressed as frequencies.

## RESULTS

A total of three thousand and fifty six (3056) samples were received for microbiological culture studies; most samples being for blood cultures followed by urine culture studies. Patient's ages ranges from 11 years to 80 years with a mean age of 40.5 years. There was female predominance in our study with female patient's samples at 55.53%. Most commonly isolated pathogen was Klebsiella spp. followed by the Escherichia coli and staphylococcus spp.; Cultures charged with pleural fluid and cerebrospinal fluid samples yielded no growth even at 72 hours. Table 1 shows the individual number of each type of sample received along with frequency of positive cultures in our study. Frequencies of individual microbes isolated, is shown in Table 1.0

## DISCUSSION

Blood culture studies are of pivotal importance however very often the results are compromised by antibiotic use coupled with lack of communicating this vital information on the request forms. Pub-

**TABLE 1.0 SHOWING FREQUENCY OF POSITIVE CULTURES IN OUR STUDY ALONG WITH THE FREQUENCIES OF INDIVIDUAL MICROBES.**

Growth	Blood	CSG	PUS	Urine	Sputum	Pleural Fluids	Total # of Isolates	% age of the Isolates*
Escherichia Coli	13	-	4	181	-	-	198	18.7
Salmonella typhi	47	-	-	2	7	-	56	5.2
Klebsiella spp	85	-	19	133	19	-	256	24.2
Proteus spp	-	-	19	10	-	-	29	2.7
Pseudomonas	5	-	18	36	2	-	61	5.7
Vibrio cholera	-	-	10	-	-	-	10	0.9
Staph spp. (Coagulase + & -)	110	-	60	11	-	-	181	17.1
Strep pneumonia	26	-	-	1	28	-	55	5.2
Staph pyogenes	4	-	9	-	7	-	20	1.8
Enterococci	61	-	8	39	-	-	108	10.2
Enterobacter	29	-	3	28	-	-	60	5.6
Candida spp	-	-	2	13	7	-	22	2
Yeast cells	-	-	-	1	-	-	1	0.09

@Percentages are calculated out of the total number of positive cultures.

Abbreviations used: Staph: Staphylococcus, Strept: Streptococcus, CSF: Cerebrospinal fluid

lished data suggest that blood cultures in patients with pneumonia yield growth by microbes in less than 10% of the culturing attempts.<sup>5</sup> One might argue that since bone marrow culturing has a higher sensitivity than blood culturing.<sup>6</sup> It remains a more invasive procedure. Resultantly, in most cases, isolation from of microbes from blood samples remains the method of choice despite the short comings.<sup>7</sup> The availability of microbiological culturing facilities in most of our healthcare setups remains a significant hurdle in the diagnostic routine. In our study the most common pathogen isolated on blood culturing turned out to be staphylococci spp. Whereas similar other local studies have reported Coliforms isolates ranked third in our study of blood cultures whereas the second largest number was of Klebsiella spp., Pseudomonas isolates occurred in only cases. This indicates the need for studies like ours in each institute, and that too regularly to identify trends specific to that population setting. A few studies do mention staphylococci. Spp. As the most commonly isolated pathogen as done by our study, which is not surprising as conditions may be similar in two different setups as well. The name of urinary tract infections (UTIs) as a part of common infections treated by health care centers and hospitals is undeniable.<sup>10-12</sup> This sample type forms a major bulk of workload in clinical microbiology laboratories.<sup>11-12</sup> Testing gold standard being bacterial culture, however can very well prove to be stressful in terms of both, time and labor. When many samples yield no growth.<sup>13</sup> Asymptomatic bacteriuria refers to the presence of live bacteria in the urine of an individual without symptoms of UTI.<sup>14</sup> Such colonization of the urinary tract pregnant women may result in severe medical and obstetric complications<sup>14-15</sup> although the same may not warrant any intervention in healthy non-pregnant females. In our study we reported Escherichia Coli as the most frequently isolated organism followed by Klebsiella sp., this is in agreement with the published literature<sup>16</sup> however, other have implicated Staphylococci as the second highest among the urinary samples' isolates.<sup>17</sup> Meningitis is a serious and potentially fatal illness. Like other diseases, a host of pathogens may cause meningitis. In study Meningococci were at the top of the isolates in CSF, followed by Hemophilus influenzae<sup>18</sup> whereas Salmonella strains have also gained importance in many developing countries in causing acute bacte-

rial meningitis in young children.<sup>19</sup> However in our study we encountered no growth on any of the plates charge with 100% of the received CSF samples. More than two thirds of chronic obstructive pulmonary disease (COPD) exacerbations are infectious in nature.<sup>20</sup> A high prevalence of bronchial colonization in COPD patients has been reported by many.<sup>24</sup> In our study we isolated Streptococcus pneumonic in 29 Cases followed by Klebsiella spp. In 18 cases, Pleural effusion is yet another sign of a serious illness caused by relatively innocent pathogen to frank malignant etiologies. Increasing evidence suggests that the choice of appropriate initial antibiotics has a significant impact on mortality rates in pneumonias<sup>22</sup> furthering stressing the need for the vital knowledge of bacterial trend. Our culture studies showed that it has been stressed that staphylococcus aureus was the most frequently encountered pathogen followed by Klebsiella and Proteus spp. These findings differ from published studies where Klebsiella spp. were found to be more common in pus specimens.<sup>23</sup> However local studies do agree with our results.<sup>24</sup>

## CONCLUSION

In contrast to other studies most commonly isolated pathogen in our laboratory over a one year period turned out to be Klebsiella spp. Followed by the Escherichia coli and staphylococcus spp. Our results demonstrate the diversity in isolates' frequencies among different center thereby further stressing the need for regular and meticulous monitoring of the incidence of microbial isolates. The practice can prove to be helpful in focusing our resources both in terms of the choice of empirical therapies in area where specialized facilities aren't available as well as the future research . furthermore our study forms the benchmark data upon which future studies can be conducted to enable focused sensitivity testing and guide clinicians in making empirical choices in the absence of critical microbiological help.

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