

## Harsukh Educational Charitable Society

### International Journal of Community Health and Medical Research

Journal home page: [www.ijchmr.com](http://www.ijchmr.com)

doi: 10.21276/ijchmr

Official Publication of "Harsukh Educational Charitable Society" [Regd.]

ISSN E: 2457-0117

ISSN P:2581-5040

RNI No. - PUNENG/2017/75049

Index Copernicus value 2016 = 52.13

## Original Article

### Prevalence of Bacterial Infections among Patients Visited in Hospital

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#### ABSTRACT

**Background:** There are many sources of infection including environmental sources, person to person, self infection, and medical or surgical procedures. The present study was conducted to assess bacterial infection among study population. **Materials & Methods:** The present study was conducted in the department of Microbiology. It comprised of 212 patients who visited the department. From all patients, wound swabs, sputum and midstream urine were received for routine culture diagnostic procedures. **Results:** Upper respiratory infection was seen in 58%, lower respiratory infection in 34% and urinary tract infection in 8%. The difference was significant ( $P < 0.05$ ). Staphylococci pyogenes was seen in 72 cases, streptococci in 66 cases, pseudomonas in 46 cases and klebsiella in 28 cases. Urine showed 56 bacterial infection, wound 72 and sputum 84. The difference was non-significant ( $P > 0.05$ ). **Conclusion:** Bacterial infection is common in all age groups. The most common bacteria involved are staphylococcus aureus followed by streptococcus pyogenes etc.

**Key words:** Bacterial, Staphylococci, Klebsiella

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**This article may be cited as:** Barala M Prevalence of Bacterial Infections among Patients Visited in Hospital. HECS Int J Comm Health Med Res 2018; 4(4):17-19

## INTRODUCTION

Infection is the most common cause of neonatal mortality worldwide. Possible severe bacterial infection (PSBI) is a clinical syndrome used in the integrated management of neonatal and childhood illness (IMNCI) package referring to a sick young infant who requires urgent referral to hospital. Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. Clinical algorithms have been developed in Nepal to direct the treatment of neonates and young children identified with PSBI as in the WHO guidelines of the integrated management of childhood illness.<sup>1</sup> There are many sources of infection including environmental sources, person to person, self infection, and medical or surgical procedures. Hospital associated infection is an important cause of patient morbidity and death and it represents a serious and growing health problem, it is estimated that about 2 million people acquire hospital infections each year and that about 90000 of these patients die as a result of their infections.<sup>2</sup> Enterobacteriaceae, Staphylococci, Pseudomonas and Acintobactr spices are the most common pathogens associated with infection and the most common sites of infection are urinary tract, lower respiratory tract, and blood stream and wound infection. Risk factors for the invasion of colonizing pathogens can be categorized into many factors including iatrogenic, organizational, the severity of illness, underlying

immunocompromized state, length of stay and susceptibility to infection such as blood group antigens. Acute lower respiratory infections (ALRIs) account for about 20% or more than two million of these deaths, making it the leading cause of deaths in children aged less than five years.<sup>3</sup> The present study was conducted to assess bacterial infection among study population.

## MATERIALS & METHODS

The present study was conducted in the department of Microbiology of Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India. It comprised of 212 patients who visited the department. All were informed regarding the study and written consent was obtained. Ethical clearance was taken prior to the study. General information such as name, age, gender etc. was recorded. From all patients, wound swabs, sputum and midstream urine were received for routine culture diagnostic procedures. Results were subjected to statistical analysis using chi-square test. P value less than 0.05 was considered significant.

## RESULTS

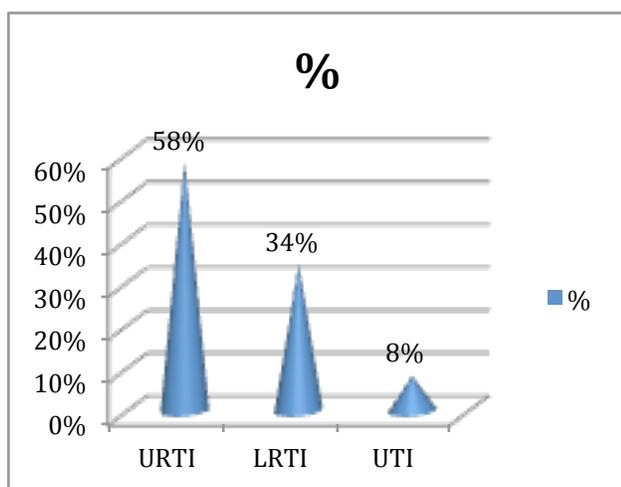
Table I shows that staphylococci was seen in 72 cases, streptococci in 66 cases, pseudomonas in 46 cases and klebsiella in 28 cases.

Urine showed 56 bacterial infection, wound 72 and sputum 84. The difference was non-significant ( $P > 0.05$ ). Graph I shows that upper respiratory infection was seen in 58%, lower respiratory infection in 34% and urinary tract infection in 8%. The difference was significant ( $P < 0.05$ ).

**Table I Prevalence of bacterial infections**

Sample	Staphylococci	Streptococci	Pseudomonas	Klebsiella	Total
Urine	16	22	10	8	56
Wound	18	24	24	6	72
Sputum	38	20	12	14	84
Total	72	66	46	28	212

**Graph I Types of infection**



## DISCUSSION

*Staphylococcus aureus* is one of the gram positive bacteria. The most important phenotypical features used in the classification of staphylococci is their ability to produce coagulase, an enzyme that causes blood clot formation. Seven species are currently recognised as being coagulase-positive: *S. aureus*, *S. delphini*, *S. hyicus*, *S. intermedius*, *S. lutrae*, *S. pseudintermedius*, and *S. schleiferi* subsp. *coagulans*. These species belong to two separate groups – the *S. aureus* group and the *S. hyicus-intermedius* group.<sup>4</sup> The present study was conducted to assess bacterial infection among study population. We found that staphylococci was seen in 72 cases, streptococci in 66 cases, pseudomonas in 46 cases and klebsiella in 28 cases. Urine showed 56 bacterial infection, wound 72 and sputum 84. This is similar to Akshay et al.<sup>5</sup> A study by Akash et al<sup>6</sup> found that 166 samples included, wound swabs, sputum and midstream urine were received for routine culture diagnostic procedures from the in-patients at Abosleem Traumatic Hospital and ABO group was obtained from Blood bank documented system for each patient. A correlation between isolated organisms and ABO system was determined. 51% patients

were infected during their stay in the hospital by one of the following isolates: *Pseudomonas* (22%); *Klebsiella* (9%); *Staphylococci* (15%); and *Streptococci* (4%). The majority of inpatients belong to blood group O (45%), preceded by group A (37%); B (14%) and AB (4%). The distribution of different blood group within four main bacterial isolates was determined as following: 43% of blood group A patients were susceptible to *pseudomonas*; (27%) *Klebsiella*; (36%) *Staphylococci*; and (29%) *Streptococci*. While, group B individuals were infected with these organisms: 16% with *Pseudomonas*, 13% with *Klebsiella*, 8% with *Staphylococci*, and 29% with *Streptococci*. Meanwhile, blood group O patients had following strains: 38% *Pseudomonas*, 53% *Klebsiella*, 52% *Staphylococci*, 42% *Streptococci*. Only, 3% of *Pseudomonas*, 7% of *Klebsiella*, and 4% of *Staphylococci* infected in-patients who expressed blood group AB. In present study we observed that upper respiratory infection was seen in 58%, lower respiratory infection in 34% and urinary tract infection in 8%. This is in agreement with Badoh et al.<sup>7</sup> The *S. pyogenes* typically colonises the throat, genital mucosa, rectum, and skin. 1% to 5% of healthy individuals have throat, vaginal, or rectal carriage. While in healthy children, such carriage rate varies from 2% to 17%.<sup>8</sup> There are four methods for the transmission of this bacteria: inhalation of respiratory droplets, skin contact, contact with objects, surface, or dust that is contaminated with bacteria, or less commonly transmission through food. Although pharyngitis is mostly viral in origin, about 15 to 30% of all pharyngitis cases in children are streptococcal; meanwhile, 5 to 20% of pharyngitis in adults are streptococcal. The number of pharyngitis cases is higher in children when compared to adults due to exposures in schools, nurseries, and lower host immunity. Such cases *Streptococcal* pharyngitis occurs more frequently from December to April (later winter to early spring) in seasonal countries, possibly due to changing climate, behavioural changes or predisposing viral infection. Disease cases are the lowest during autumn.

## CONCLUSION

Bacterial infection is common in all age groups. The most common bacteria involved are *staphylococcus aureus* followed by *streptococcus pyogenes* etc.

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**Source of support:** Nil

**Conflict of interest:** None declared

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