Seasonal variation in major post surgical site infection micro-organism in SMS Hospital Jaipur (Rajasthan) India

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Abstract— *Season seems to have its role in wound infection which is the second commonest nosocomial infection and most troublesome disorder of wound healing. This study was carried out on 100 post-operative cases of Surgical Unit 1st of General Surgery Department of Sawai Man Singh Hospital, Jaipur (Rajasthan) India in years 2014. This study aimed to find out the seasonal trend in Post-operative wound infections (PSI). After interview of these, swab from post-operative wound was taken and sent for culture and sensitivity test in Microbiology. Results were inferred by Chi-square test. In this study, post-operative wound infection rate was found 21%. In majority of cases, causative agent found in post-operative infected wound was Staphylococci (90.48%) followed with Streptococci, E. Coli, Klebsella and Pseudomonas. Maximum cases were found in April followed by March, January and none was found in other months but this variation was not found significant.*

Keywords— Post-operative wound Infection, Seasonal Variation, Micro-organism.

I. INTRODUCTION

Wound infection is the commonest and most troublesome disorder of wound healing[1]. The discovery of the antimicrobial agents also enables us to perform surgery in many conditions that were previously thought to be impossible in the pre-antibiotic era due to the risk of infection[2]. Infection in a wound is a manifestation of disturbed host-bacteria equilibrium that is in favour of bacteria. The absolute prevention of surgical wound infection seems to be an impossible goal.

It is the second commonest nosocomial infection[3] and causes patient discomfort, prolonged hospital stay, more days off work, increased cost of therapy and the cost of an operation increase by 300% to 400%[4]. An important requirement in the prevention of SSI is the availability of correct and recent data i.e. surgical audit and wound surveillance.

The majorities of micro-organisms are less than 0.1mm in diameter and can therefore only be seen under a microscope. They can be categorized into different groups, such as bacteria, fungi, protozoa and viruses, depending on their structure and metabolic capabilities[5].

A recent systematic review of antimicrobial agents has concluded that systemic or topical antimicrobials are not generally indicated for the management of chronic wound infections[6]. However, there may be some value in the prophylactic use of topical antimicrobials for the initial management of acute cellulitis, whilst awaiting clarification of antibiotic sensitivity and the establishment of a therapeutic regimen.

Resistance to antibiotics has become a serious problem in recent years particularly with the rise of epidemic strains of MRSA. It could therefore be suggested that all antibiotic use should be based on known sensitivities.

This study was designed and conducted in Surgical wards of Sawai Man Singh Hospital, Jaipur (Rajasthan) India to find out the seasonal trend in Post-operative wound infections (PSI). Profile of post operative infection of surgical wounds and its associating factors of this study was reported elsewhere.

II. METHODOLOGY

A descriptive type of observational study was carried out on 100 post-operative cases of Surgical Unit 1st of General Surgery Department of Sawai Man Singh Hospital, Jaipur (Rajasthan) India in years 2014.

Sample size was calculated[7] 100 subjects accepting assuming 6% of absolute allowable error at 95% confidence limit assuming **10%** overall prevalence of post operative wound infections.[8] For study purpose post-operative cases operated within 10 days excluding extremes of ages (<20 and >60 years) and those who either not given consent for the study or not able to communicate or had other chronic illness were included. These patients were interviewed in details clinic-demographic details as per proforma. Swab from post-operative wound was taken and sent for culture and sensitivity test in Microbiology department of SMS Medical College, Jaipur. Report of culture and sensitivity was also recorded in prescribed space in proforma. Seasonal variation of these cases were also observed.

Statistical Analysis: Significance of seasonal variation in PSI was analysed by Chi-square test with the statistical software Primer version 6.

III. RESULTS

Out of total 100 cases of post-operative wound sent for culture and sensitivity, 21% were found infected. (Figure 1)

Figure 1

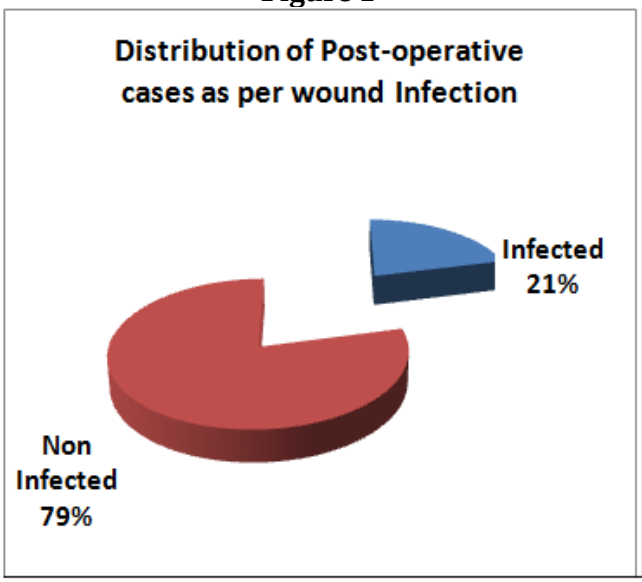
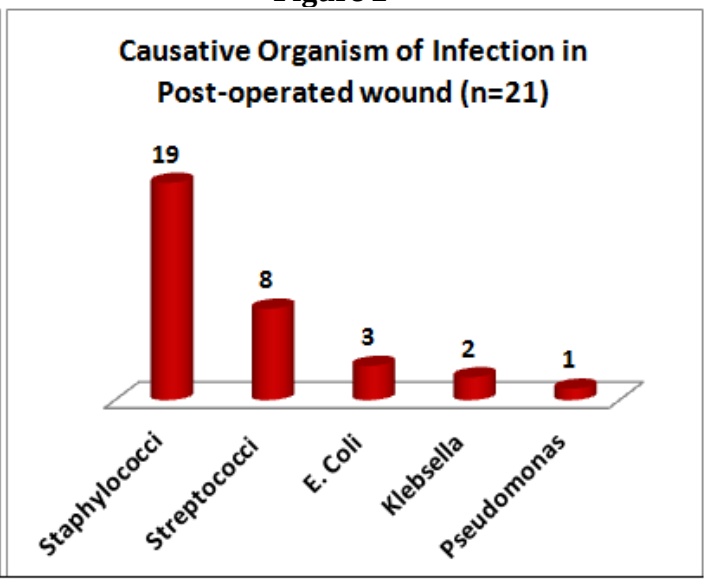


Figure 2



Major micro-organism found were Staphylococci, Streptococci, E. Coli, Klebsella and Psuedomonas. Out of total 21 cases where post-operative wound was found infected, Staphylococci was found in 19

(90.48%) cases and Streptococci, E. Coli, Klebsella and Psuedomonas were found in 8 (38.1%), 3 (14.29%), 2 (9.52%) and one (4.76%) case respectively. (Table 1 and Figure 2)

Table No. 1

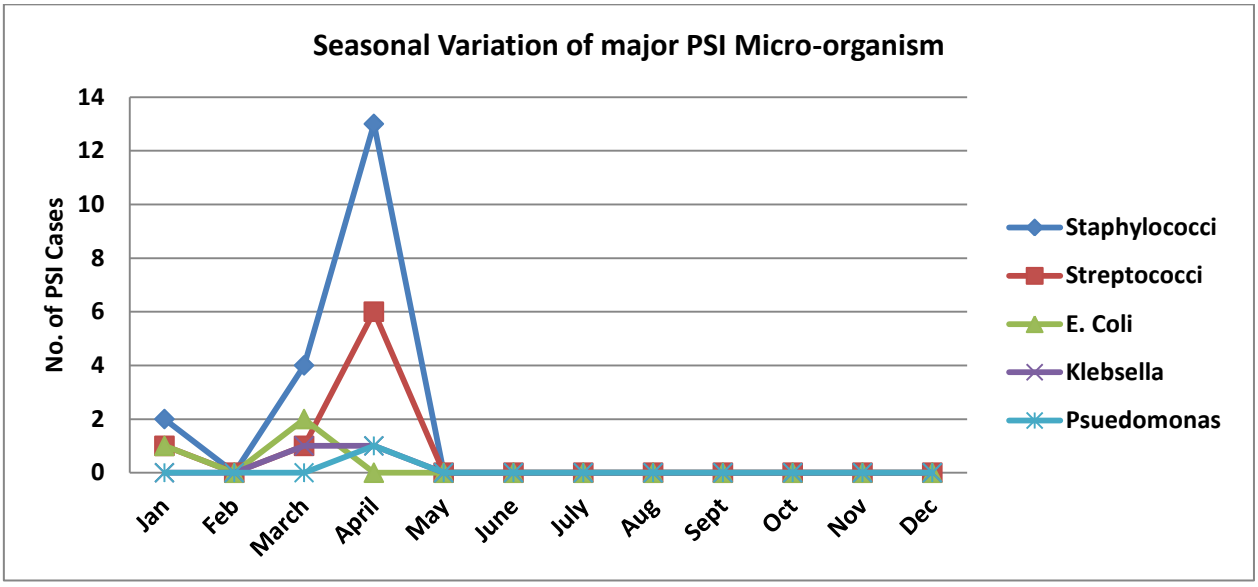
Causative Organism of Infection in Post-operated wound and their seasonal Variation (n=21)

S. No.	Causative Organism	Months					Total PSI Cases	
		Jan.	Feb.	March	April	May to Dec.	*Number	%
1	**Staphylococci**	2	0	4	13	0	19	90.48
2	**Streptococci**	1	0	1	6	0	8	38.1
3	**E. Coli**	1	0	2	0	0	3	14.29
4	**Klebsella**	0	0	1	1	0	2	9.52
5	**Pseudomonas**	0	0	0	1	0	1	4.76

multiple response** **Chi-square test=7.746 at 8 DF** **P Value=0.486** **LS=NS

When seasonal variation of PSI was observed it was found that although maximum cases were in Aprill followed with March and January but this seasonal variation as per causative agent was not found significant (p>0.05). (Figure 3)

Figure 3



IV. DISCUSSION

In this study, post-operative wound infection rate was found 21%. Damani etall[7] found wound infection rate was 11% in their study. Another study has quoted a figure of 40% in all clean and clean contaminated procedures, resulting in increased cost and morbidity of the patient.[9] A study conducted at Mayo Hospital, Lahore reported an infection rate of 5.05% in clean and 8.39% amongst clean-contaminated cases.[7] Different studies have shown a range of 5-30% post-operative wound infection rate[11]

The present study also shows that maximum proportion of causative agent found in post-operative infected wound was Staphylococci (90.48%) followed with Streptococci, E. Coli, Klebsella and Pseudomonas. Masood etall[10] also observed the common organisms involved in the SSI were Staphylococcus aureus, E. coli, Streptococcus pyogenes and Pseudomonas group. Arora etall[11] also have reported *Staphylococcus aureus* has been described as the most common single pathogen involved in postoperative wound infections.

This study also revealed that although maximum cases were found in April followed by March, January and none was found in other months but this variation was not found significant. However Kane P etall 12 reported that there was a statistically significant difference in infection rate between summer/fall (3.6%) vs winter/spring (1.0%). They reported more post surgical infections in summer months than in winters.

V. CONCLUSION

In this study, post-operative wound infection rate was found 21%. In majority of cases, causative agent found in post-operative infected wound was Staphylococci (90.48%) followed with Streptococci, E. Coli, Klebsella and Pseudomonas. Maximum cases were found in April followed by March, January and none was found in other months but this variation was not found significant.

CONFLICT OF INTEREST

None declared till now.

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