Research Paper

Volume : 3 | Issue : 1 | January 2014 • ISSN No 2277 - 8179

Surgical Site Infections in General Surgery & Changing Trends of Isolated Microorganisms at Civil Hospital, Ahmedabad

Medical Science

KEYWORDS : Surgical Site Infections (SSI), General Surgery, Changing trends

Dr Abhishek J Savalia MS (Gen. Surgery), Dept. of Gen. Surgery,, Civil Hospital, Ahmedabad

Dr Garima Gahlot Dept. of Microbiology, Civil hospital, Ahmedabad

ABSTRACT

Background : 'Surgical Site Infection' (SSI),which essentially means infection of a surgical incision,are the second most common healthcare-associated infection after catheter associated UTI (1,2).

Objective : To calculate the incidence of SSI in General Surgery
Find out the common pathogenic microorganisms causing it.
Material and methods
A prospective study was performed from 1 January 2012 to 26 November 2012 in Monday Surgical unit in Dept. of General Surgery, Civil Hospital, Ahmedabad. Post operatively, patients' surgical incisions were examined regularly for clinical signs of SSI. Infections were identified and swabs of discharge were sent for culture and sensitivity reporting and the causative pathogens and their sensitivity recorded. The incidence rate of SSI was also calculated every month.
Results : During the study period, out of 1024 patients operated, 53 SSIs were registered. The average incidence rate of SSI was 5.17%. The most common microorganism causing SSI were Pseudomonas (35.3%), followed by E. coli (18.66%), Klebsiella (13.5%), Acinetobacter (13.5%), Staph. aureus (6.34%) and Proteus (3.96%).
Thus, the Enterobactericiae, E coli, Klebsiella, Proteus together - account for maximum SSIs.
Conclusion : The trend of microorganisms causing SSI has changed –In past, Staph aureus was the most commonly isolated pathogen, whereas nowadays multi drug resistant Enterobactericiae and Pseudomonas have taken over as the most commonly isolated pathogens.

Introduction

In 1992, the U S Center for Disease Control (CDC) coined the term 'Surgical Site Infection' (SSI) – which essentially means infection of a surgical incision – in order to avoid confusing it with 'wound infection' (i.e. infection of a traumatic wound), (1)

Until the middle of the 19th century, before Joseph Lister introduced antiseptic surgery, most wounds - surgical or traumatic -became infected.

Before the antibiotic era, Staph aureus and S. pyogenes were the most common causes of SSI.After introduction of Penicillin, drug resistant Staph aureus was the commonest cause.

Over the last few years, this trend has changed in the field of General Surgery.

This study aims to determine the current incidence of SSI and the trend of causative organisms in General Surgery dept. of Civil Hospital, Ahmedabad.

Material and Methods

A prospective study was performed from 1 January 2012 to 26 November 2012 in Monday Surgical unit in Dept. of General Surgery, Civil Hospital, Ahmedabad.

During this period 1024 patients underwent operative procedures which fulfilled the criteria, set by CDC, to include in SSI surveillance. (1)

Post operatively, patients' surgical incisions were examined regularly for clinical signs of SSI.

SSI was diagnosed on the basis of criteria set by CDC. (3)

Swabs of discharge and in some cases aspirates and drain fluid were sent for culture and sensitivity reporting and the causative pathogens and their sensitivity recorded. Culture negative infections were not considered as SSI.

The swabs were processed for Gram stain & cultured on nutrient agar & MacConkey agar using standard procedures.

Antibiotic susceptibility of isolates was tested using the modified Kirby Bauer disc diffusion method.

Equation for calculating SSI Rate (3)

$$\text{SSI rate} = \frac{\textit{Number of SSIs per month}}{\textit{Total number of procedures In that month}} \times 100$$

Statistics

SSI rate was compared using Chi-square test.P value of more than 0.05 was considered statistically significant.

Results

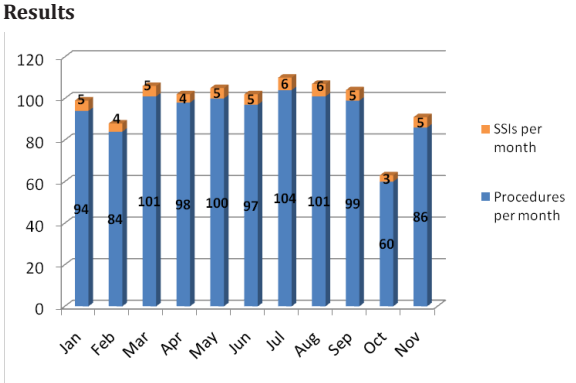


Fig- 1 Number of Procedures and SSIs in each month

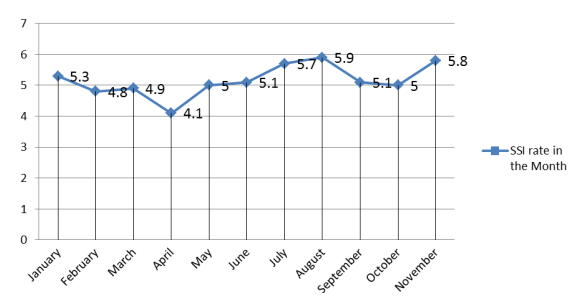


Fig 2SSI rate per month The Average SSI rate was 5.17%

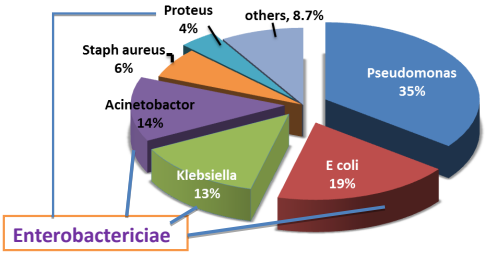


Fig 3 Isolated Microorganisms from SSI

The most common microorganisms causing SSI were Pseudomonas sp. (35.3%), followed by E. coli (18.66%), Klebsiella (13.5%), Acinetobacter (13.5%), Staph. aureus (6.34%) and Proteus (3.96%).

Discussion

The average SSI rate for the year of 2012 was 5.17% in the dept. of General surgery, which is better than the average rate of 10.9%, for the year 2006, for Civil Hospital, Ahmedabad.(4)

[X^2value is 5.87 which is more than 3.84 (X^2value at P=0.05 and 1 degree of freedom). Thus the difference is statistically significant.]

The average SSI rate for 2012 in Rush University Medical Centre was 4.4%, and whole of USA was 3.8%. (5)

The X^2value is 0.2 which is less than 5.99 (X^2 valueat p=0.05 and 2 degrees of freedom)

Hence, the difference in SSI rates is not statistically significant and SSI rate of our study is comparable with that of Rush University and USA for the year 2012.

The most common microorganisms causing SSI were Pseudomonas sp. followed by E. coli, Klebsiella, Acinetobacter, Staph aureus and Proteus in descending order.

However, the **Enterobactericiae** - E coli, Klebsiella, Acinetobacter and Proteus put together - **account for maximum SSIs.**

This is in confirmation of the changing trend seen worldwide in SSIs in General Surgery.(6,7)

Conclusion

The incidence rate of SSI has decreased over the years in our institute and is at par with USA average SSI rate for the year 2012. It is **necessary to maintain continuous surveillance of SSI as it acts as a touchstone for preventive measures.**

Enterobactericiae and Pseudomonas have taken over as the most commonly isolated pathogens. [(6) (7)]

The clinician should give **antimicrobials according to the sensitivity report provided by microbiologists** for swift response and to avoid multi drug resistance.

REFERENCE

1. Horan TC, Gaynes RP, Martone WJ, Jarvis WR, Emori TG. CDC definitions of nosocomial surgical site infections, 1992; A modification of CDC definitions of surgical wound infections. Infection Control Hosp Epidemiol. 1992; 13 606-608 | 2. Stone P W. Economic Burden oh Healthcare Associated Infections : an American Perspective. Expert Rev. PharmacoeconomicsRes. 9(5), 417-422(2009) | 3. Centers for Disease Control and Prevention. The National Healthcare Safety Network (NHSN) Manual. Patient Safety Component Protocol. 2011 | 4. Patel Disha A, Patel Kiran B, Bhatt Seema K, Shah Hetal S. Surveillance Of Hospital Acquired Infection In Surgical Wards In Tertiary Care Centre Ahmedabad, Gujarat. National Journal of Community Medicine, v. 2(3), 340-345 | 5. Rush's Surgical Patient Outcomes (2012). http://www.rush.edu/rumc/print-page-1298329698953.html#surgicalsite (Dec. 2013) | 6. Surveillance of Surgical Site Infections in NHS hospitals in England (2011/2012).www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317137334452 (Dec. 2013) | 7. Syed Asad Ali, S. M. Tahir, Abdul Sattar Memon, Noshad A. Shaikh. Pattern Of Pathogens And Their Sensitivity Isolated From Superficial Surgical Site Infections In A Tertiary Care Hospital. J Ayub Med Coll Abbottabad 2009;21(2) |