Original Article

MJSBH July-December 2012|Vol 11| Issue 2

Surgical Site Infection, Bacterial Isolates and Their Sensitivity Pattern at Surgical Ward.

Sushila Devi Bhandari[1].

[1] **Department of Nursing, Shree Birendra Hospital.**

ABSTRACT

Introduction: Surgical site infection is a common occurrence in surgical ward. Knowledge about the commonest pathogen and its sensitivity in a particular setting is crucial in selection of appropriate antibiotics. No study has been performed earlier to identify the pattern of infection and antibiotic sensitivity in surgical department. So, this study aimed to analyze the commonest isolates from surgical site infection and their sensitivity pattern. **Methods:** A total of 56 cases of surgical site infection who were admitted in surgical ward at Shree Birendra Hospital, were included in this study. Wound swab from the infected surgical site was taken and send for culture and sensitivity. The obtained results were analysed using descriptive tools. **Results:** Among 56 surgical site infections only in 30 cases a pathogen was isolated. The commonest organism isolated was E.Coli 15(50%) followed by Staph. Aureus. The most sensitive antibiotics was Amikacine for E. Coli, and cefixime for S. Aureus. **Conclusions:** Ciprofloxacin seems to be the most appropriate first line oral antibiotics as it is sensitive both to E. Coli and S Aureus.

Keywords: isolates, antibiotics, sensitivity.

INTRODUCTION

Unfortunately, Surgical Site Infection (SSI) is a common problem in post-surgery patients. Surgical site infection can be defined as the presences of pus along with signs of inflammation in the surgical wound margins. The risk of infection after surgery depends upon the factors including the type and length of the surgical procedure, age, underlying conditions and previous history of the patient, skills of the surgeon, the type and timing of pre-operative antibiotics prophylaxis surgical team, nurses and environment.

SSI delays recovery and require extra resources for investigations, management and nursing care. Several factors play an important role and preventive procedure is considered as the mainstay[1]. But treatment of already infected wound requires appropriate antibiotics, which should be started immediately before the culture report is available. Choice of antibiotic should be based on most likely pathogen, but over a period of time the sensitivity pattern keeps on changing[2]. So, knowledge about the commonest pathogen and its sensitivity in that particular setting is important to make a better choice. At present, we are lacking our own data of bacterial isolates and their sensitivity pattern in surgical site infection. So, this study aimed to analyze the commonest isolates from surgical site infection and their sensitivity pattern.

METHODS

This was a prospective study conducted in surgical ward of Shree Birendra Hospital,Chhauni, between March and June 2012. This study included all the patients with post-operative surgical site infection and excluded patients with bed sore and. There were all together 56 SSI, wound swab, pus or both if present were collected in a sterile container and immediately submitted for culture and sensitivity test at department of pathology. Culture and sensitivity test was performed by a microbiologist as per the routine, who was blinded about the study. Culture and sensitivity reports were collected and descriptive analysis was done using Statistical Program for Social Sciences13.

RESULTS

Among 56 cases of SSI only 30 cases had geowth in culture media. Majority of our patients 24 (80%) were male and only 6 (20%) were female with age ranged from 16 to 67 years.

Correspondence:
Lt. Col Sushila Devi Bhandari
Nepalese Army Institute of Health Sciences,
College of Nursing,
Kathmandu Nepal
Email: ya_su_sa@hotmail.comMobile
Phone: +977- 9841422518

There were five different types of bacteria among 30 culture reports available for analysis. Escherichia Coli 50% (n 15) was the most common organism isolated followed by Staphylococcus aureus in 30% (n 9) and Coagulase negative Staphylococcus in 10% (n3) (Table 1).

Table 1: Pathogens Isolates from Surgical Site Infections

Bacterial Growth	Number	Percent
Escherichia Coli	15	50
Staphylococcus aureus	9	30
Coagulase negative Staphylococcus	3	10
Citrobacterfruendii	2	6.7
Streptococcus	1	3.3

Amongst 15 cases of E.coli isolated, the most sensitive drug for E. Coli was Amikacine (13 out of 15), followed by ciprofloxacine (9 out of 15) and Imipenem (8 out of 15). All 15 cases of isolated E. coli were resistant to amoxycilline, 11 were resistant to Cifixime and 10 were resistant to cefotaxime (Table 2).

Among 9 cases of S. aureus, 7 were resistant to amoxycilline, 5 were resistant to cloxacillin, 4 resistant to Co-trimoxazole and 3 were resistant to Ofloxacine and cefotaxim. The S. aureus was most sensitive to Cefixime (8 out of 9 were sensitive), followed by Ciprofloxacine (6 out of 9) (Table 2).

DISCUSSION

Surgical site infections have been shown to compose up to 20% of all of healthcare-associated infections. At least 5% of patients undergoing a surgical procedure develop a surgical site infection[1]. The majority of surgical site infections are preventable. Measures can be taken in the pre-, intra- and postoperative phases of care to reduce risk of infection. Surgical site infections can have a significant effect on quality of life for the patient. They are associated with considerable morbidity and extended hospital stay. In addition, surgical site infections result in a considerable financial burden to healthcare providers[1].

Among the 30 culture positive cases, the commonest isolate was E. Coli followed by S. aureus. A similar study done by Ali and his colleague[2], they also found that E.Coli was the commonest isolate. Another Study done by Markovic[3] et al found Saphylococus Aureus as the commonest isolate in their study. Like in our series, many authors have agreed that E. Coli and S. aureus are the commonest pathogen to cause SSI.

Among 15 cases of E.coli isolated, the most sensitive drug for E. Coli was Amikacine (13 out of 15%), followed by ciprofloxacine (9 out of 15) and Imipenem (8 out of 15). All 15 cases of isolated E. coli were resistant to amoxycilline,

Table2: Antibiotic Sensitivity test

Bacteria	Staph. aureus			Coagulase negative staph.		Escherichia Coli		Citrobacter frundii		Strept. Spp	
	R	S	PS	R	S	R	S	R	S	R	S
Amoxycilline	7	2	-	1	1	15	-	2	-	1	-
Cloxacilline	5	4		1	1	-	-	-	-	1	-
Ciprofloxacilline	2	6	1	1	1	5	9	1	1	-	1
Cephalexin		2	1	-	-	-	1	-	-	-	-
Co-trimoxazole	4	4	-	1	-	8	6	1	-	1	-
Gentamycine	-	-	-	-	-	-	-	-	-	-	-
Nitrofurantion	-	-	-	-	-	-	-	-	-	-	-
Norfloxacine	-	-	-	-	-	-	-	-	-	-	-
Amikacine	1	1	-	-	-	-	13	1	1	-	-
Imipenum	-	-	-	-		7	8	-	1	-	-
Ofloxacine	3	4	2	1	1	-	-	1	1	-	1
Pipera+tazobactam	-	-	-	-	-	-	-	1	-	-	-
Ceftriaxone	1	1		1		1	-	1	-	-	-
Cefixime	-	8	-	1	1	11	1	2	-	1	-
Cefotaxim	3	3		1	1	10	1	2	-	-	1
Amoxiclav	-	-	-	-	-	-	-	1	-	-	-
Azithromycin	2	2	-	1	1	-	--	-	-	-	-
Meropenum	-	1	-	-	-	-	-	-	-	-	-
Vencromycin	-	1	-	-	-	-	-	-	-	-	-

*R-Resistant, S-Sensitivity, PS- Partially sensitive.

11 were resistant to Cifixime and 10 were resistant to cefotaxime (Table 2). Although cefixime is recommended as first line of treatment by most of the literatures, it is least sensitive in our context[4-8].

The next most common isolate was S. aureus. Among 9 cases of S. aureus, 7 were resistant to amoxycilline, 5 were resistant to cloxacillin, 4 resistant to Co-trimoxazole and 3 were resistant to Ofloxacine and cefotaxim. The S. aureus was most sensitive to Cefixime (8 out of 9 were sensitive), followed by Ciprofloxacine (6 out of 9) (Table 2). Although Cefixime is most sensitive drug to S. aureus but least sensitive to E. Coli, so as an imperical therapy, Ciprofloxacine seems to be the better choice of antibiotics before the culture and sensitivity report. This is consistent with other similar published article[8-14].

CONCLUSIONS

Escherichia Coli is the most common organism causing postoperative infections followed by Staph. aureus in our context. Although, cefixime is the most sensitive to Staph. aureus, the commonest organism E. Coli were resistant to it. However Ciprofloxacin is sensitive to bothe E. Coli and Staph. aureus, so in our setting Ciprofloxacin can be considered as 1st line oral antibiotics before the culture reports are available.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Lt. Col. Dr Amit Joshi and Assistant Professor Bijaya Devkota for their guidance and suggestions.

REFERENCES

1. Surgical site infection - NICE guideline - National Institute for Health. From www.nice.org.uk/nicemedia/pdf/CG74NICEGuideline.pdf.

2. Ali SA, Tahir SM, Memon AS, Shaikh NA. 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):80-2.

3. Marković-Djenić I, Maksimović J, Lesić A, Stefanović S, Bumbasirević M. Etiology of surgical site infections at the orthopaedic trauma units. Acta Chir Iugosl. 2009;56(2):81-6.

4. Yalcin AN, Serin S, Gurses E, Zencir M. Surgical Antibiotic Prophylaxis in Turkish University Hospital. J Chemother. 1995;14:373-7.

5. Monica C. District laboratory practices in tropicalcountries. Part 2.Cambridge University Press.

6. Khadka SB, Thapa B, Mahat K. Nosocomial Citrobacter Infection in Neonatal Intensive Care Unit in a Hospital of Nepal. J. Nepal Paediatr. Soc. 2011;31(2):105-9.

7. Thapa B, Adhikari P, MahatK,Chhetri MR, Joshi LN.Multidrug-resistant nosocomial Citrobacter in a Hospitalin Kathmandu. Nepal Med College J. 2009;11:195-9.

8. Thapa B, Tribuddharat C, Rugdeekha S, TechachaiwiwatW, Srifuengfung S, Dhiraputra C. Rifampin resistance incarbapenem-resistant Acinetobacterbaumannii in Siriraj Hospital, Thailand. Nepal Med Coll J. 2009;11:232-7.

9. Koning S. Fusidic acid cream in the treatment of impetigo ingeneral Practice: double blind randomized placebo controlledtrial. Brit Med J 2002; 65: 203-6.

10. Koning S, Verhagen AP, van Suijlekom-Smit LW, Morris A, Butler CC, van der Wouden JC. Interventions for impetigo. - Cochrane Database Syst Rev. 2004;(2):CD003261.

11. Hoekelman RA, Adam HM, Nelson NM. Primary pediatric care. 4th edition. Philadelphia: Mosby 2001:p1343-5.

12. Burns CE, Dunn AM, Brady MA .Pediatric primary care. 3rd edition. Philadelphia: WB Saunders 2004: p1070-2.

13. Wilkinson. Fusidic acid in dermatology. Brit J Dermatol. 2002;139:37-40.

14. Werner AH, Russel AD Mupirocin, fusidic acid and bacteria sensitivity; action and clinical uses of three topical antibiotics.Vet Dermatol. 2002;10:225-40.

15. Gilbert M. Topical 2% mupirocin versus fusidic acid ointmentin the treatment of primary and secondary skin infections.J Amer Acad Dermatol. 1989;20:1083-7.