CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3819874

Available online at: http://www.iajps.com *Research Article*

SURGICAL SITE INFECTIONS IN CLEAN AND CLEAN CONTAMINATED SURGERIES AND ITS ASSOCIATION WITH THREE VERSUS SIX DOSES OF PROPHYLACTIC ANTIBIOTICS GIVEN POST OPERATIVELY

[1]Dr. Ramsha Mushtaq Khan, [2]Dr. Nida Hafeez, [3]Dr Arooj Kiran
[1]Jinnah Hospital Lahore
[2]Sir Ganga Ram Hospital, Lahore
[3]Jinnah Hospital Lahore

Article Received: March 2020 **Accepted:** April 2020 **Published:** May 2020

Abstract:
Objective: *find more effective regimen for giving prophylactic antibiotics postoperatively in order to limit the surgical site infection rate to minimum.*
Methodology: *the study was carried out in general surgical unit of Jinnah hospital Lahore over a period of six months using a sample size of 60 patients operated for clean and clean contaminated surgeries.30 patients were given 3 doses of cephalosporin while 30 were given 6 doses of the same antibiotic. Consent was taken prior to evaluation*
The patients were monitored for development of any infectious signs and symptoms at the site of surgery during their stay in the hospital via routine post op rounds.
Results: *there was no difference between the infectious rate of both doses given post operatively if any. Chi suare test was applied and it showed insignificant association between doses and development of infection.*
Conclusion: *the number of dose does not affect the development of surgical site infection if any in post-operative patients.*
Key words: *Surgical site infections, cephalosporins.*

Corresponding author:
Dr. Ramsha Mushtaq Khan,
Jinnah Hospital Lahore

QR code

Please cite this article in press Ramsha Mushtaq Khan et al, ***Surgical Site Infections In Clean And Clean Contaminated Surgeries And Its Association With Three Versus Six Doses Of Prophylactic Antibiotics Given Post Operatively.,*** *Indo Am. J. P. Sci, 2020; 07(05).*

INTRODUCTION:

A surgical site infection (SSI) is an infection that develops as a direct result of an operative procedure being performed on a patient. These infections are associated with increased morbidity and mortality, increased length of stay and higher healthcare costs ,lead to a failure in wound healing, with greater likelihood of admission to intensive care unit (ICU), thereby accounting for one third of the post op mortality cases.[1] Globally it is the third most commonly reported health care associated infection and accounts for 14-16% of all nosocomial infections among hospital inpatients.[2]In Spain, the prevalence of SSI is estimated at 5-10%.Mortality attributable to SSI is 0.6% per year and that associated with SSI is 1.9%. In the USA, SSI lengthens the hospital stay by an average of 7.3 days with an additional cost of $3200 per day[3]. A study in Pakistan confirmed that 13% of patients who underwent clean and clean contaminated surgery had SSIs.[4].most important risk factors for the development of SSIs include the type of the surgery offered followed by post op care.[3] Preventing surgical site infection (SSI) through anti-microbial prophylaxis is important in defying the risk factors leading to causation of SSIs. According to the Centers for Disease Control and Prevention (CDC) National Nosocomial Infection Survey (NNIS) definition, a SSI is confirmed if one out of the following four criteria is fulfilled: (1) purulent discharge from surgical site; (2) a positive culture result from wound swab; (3) local symptoms (4) clinical suspicion made by a surgeon or physician.[5]However, the judicious use of prophylactic antibiotics can reduce the incidence of such health care associated infections. A common therapeutic class used for prophylaxis in patients suspected of developing SSI is third generation cephalosporin administered usually by the intravenous route [6] within one hour prior to surgery. Adequate build up tissue concentrations of the antibiotic should be present at the time of the incision and throughout the procedure. This entails administration prior to incision. Further evidence shows that low tissue concentration of antibiotics at the time of wound closure is associated with higher SSI rates Though SSIs risk varies by procedure offered and factors governing patient's immunity and resilience to infections but in this study an effort to optimize the dose of antibiotic administered prophylactically for prevention of such infections through assessing the incidence of surgical site infection in two groups had been done to minimize its incidence.

METHODOLOGY:

Research was carried out in general surgical ward of Jinnah hospital Lahore after taking permission from the review board.it was a cross sectional study that included 60 consecutive general surgical patients ,30 were given 3 doses of antibiotic cefotaxime (cephalosporin),30 were given 6 doses keeping all other variables the same.the study was expanded over a period of 6 months with exclusion of diabetics and immunosuppressed. Sample size was calculated using a who sample size calculator. Signs and symptoms of development of infection at the surgical site were noted (if any) during routine post-operative rounds .data was added and analysed using Spss version19.

RESULTS:

Number of doses of antibiotics used	Patients who developed infection	Healthy patients
3 doses of antibiotic	**5**	**25**
6 doses of antibiotic	**4**	**26**

In a total sample of 60 consecutive consenting patients out of 30 who were given 3 doses of ceftriaxone antibiotic only 5 developed surgical site infection ,16.7% whereas out of 30 those who were given 6 doses 4 developed surgical site infections,13.3%.chi square test when applied gives no significant association between the number of doses and development of infection $p<0.001$.

DISCUSSION:

In a total sample of 60 consecutive consenting patients out of 30 who were given 3 doses of ceftriaxone antibiotic only 5 developed surgical site infection ,16.7% whereas out of 30 those who were given 6 doses 4 developed surgical site infections,13.3%.chi square test when applied gives no significant association between the number of doses and development of infection $p<0.001$.careful selected antibiotics given prophylactically can safe a patient from detrimental effects of sepsis and later septic shock resulting in death.(25,26)A prophylactic dose given reduces the number of bacteria present at the site of surgery(27).Rapidly developing resistance against the microorganisms commonly associated with surgical site infections

renders need for a very close selection of antibiotic cover and its dose given and the time elapsed between the dose also serves a very valid purpose in its prevention(28).For antibiotics as floroquinolones and vancomycin given within 1 to 2 hours pre operatively is adequately enough.(23,24).general surgeries such as colorectal surgery pose a greater risk because of extensivity of bacteriodes and indwelling organisms(30).A review of 2000 patients in Cochrane did not show any different results in prevention of surgical site infection when given different doses of antibiotics intravenously.(29,25)

Conflict of interest: there is no conflict of interest in this study.no funding of any kind was done.

REFERENCES:

1. National Collaborating Centre for Women's and Children's Health N, Wilkins, R. G., & Unverdorben, M. (2013). Wound Cleaning and Wound Healing : A Concise Review, 26(4) 160–163.,
2. Wilgus, T. A., Roy, S., & Mcdaniel, J. C. (2013). Neutrophils and Wound Repair : Positive Actions and Negative Reactions, 2(7) 379–388. http://doi.org/10.1089/wound.2012.0383,
3. Nagoba, B. S., Selkar, S. P., Wadher, B. J., & Gandhi, R. C. (2013). Acetic acid treatment of pseudomonal wound infections — A review. Journal of Infection and Public Health, 6(6) 410–415. http://doi.org/10.1016/j.jiph.2013.05.005,
4. Daeschlein G (2013). A and antiseptic strategies in wound management. http://doi. org/10. 1111/iwj. 1217., Goldberg, S. R., & Diegelmann, R. F. (2017). Wo u n d H ea l i n g P ri m er, 90(2010) 1133–1146. http://doi.org/10.1016/j.suc.2010.08.003, et al. Surgical Site Infection: Prevention and Treatment of Surgical Site Infection. National Institute for Health and Care Excellence - Clinical Guidelines. 2008.
5. Smyth ETM, Emmerson AM. Surgical site infection surveillance. Journal of Hospital Infection. 2000. Santalla A, López-Criado MS, Ruiz MD, Fernández-Parra J, Gallo JL, Montoya F. Surgical site infection. Prevention and treatment. Clin Invest Ginecol Obstet. 2007;
6. Sangrasi AK, Leghari AA, Memon A, Talpur AK, Qureshi GA, Memon JM. Surgical site infection rate and associated risk factors in elective general surgery at a public sector medical university in Pakistan. Int Wound J. 2008;
7. Krukerink M, Kievit J, Marang-van de Mheen PJ. Evaluation of routinely reported surgical site infections against microbiological culture results: A tool to identify patient groups where diagnosis and treatment may be improved. BMC Infect Dis. 2009; Fletcher N, Sofianos D, Berkes MB, Obremskey WT. Prevention of perioperative infection. Journal of Bone and Joint Surgery - Series A. 2007.
8. Hawn M, Vick CC, Richman J, et al. Surgical site infection prevention. Ann Surg 2011;8:494–501.
9. \Anthony T, Murray B, Sum-Ping W, et al. Evaluating an evidence-based bundle for preventing surgical site infection: a randomized trial. Arch Surg 2011;146(3): 263–9.
10. Astagneau P, Rioux C, Golliot F, et al, INCISO Network Study Group. Morbidity and mortality associated with surgical site infections: results from the 1997–1999 INCISO surveillance. J Hosp Infect 2001;48(4):267–74.
11. Anderson DJ, Kaye KS, Classen D, et al. Strategies to prevent surgical site infections in acute care hospitals. Infect Control Hosp Epidemiol 2008;29: S51–61.
12. Kirkland KB, Briggs JP, Trivette SL, et al. The impact of surgical-site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs. Infect Control Hosp Epidemiol 1999;20(11):725–30. Anthony T, Long J, Hynan LS, et al. Surgical complications exert a lasting effect on disease-specific health-related quality of life for patients with colorectal cancer. Surgery 2003;134(2):119–25.
13. Urban JA. Cost analysis of surgical site infections. Surg Infect (Larchmt) 2006; 7(Suppl l):S19.
14. Stone PW, Braccia D, Larson E. Systematic review of economic analyses of health care-associated infections. Am J Infect Control 2005;33:501–9.
15. Healthcare associated infections: surgical site infections. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/HAI/ssi/ssi.html. Accessed July 3, 2014.
16. CDC. About the National Healthcare Safety Network, 2014. Available at: http:// www.cdc.gov/nhsn/about.html. Accessed May 30, 2014.
17. April 2013 CDC/NHSN protocol corrections, clarification, and additions. Available at: http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf. Accessed May 30, 2014.
18. American College of Surgeons. National Surgical Quality Improvement Program Operations Manual. Effective Jan. 1 2014 – June 30 2014.
19. Horan TC, Gaynes RP, Martone WJ, et al. CDC definitions of nosocomial surgical site infections, 1992: a modification of CDC definitions of surgical wound infections. Infect Control Hosp Epidemiol 1992;13(10):606–8.

20. Bratzler DW, Hunt DR. The surgical infection prevention and surgical care improvement projects: national initiatives to improve outcomes for patients having surgery. Clin Infect Dis 2006;43:322.
21. Jarvis WR. Epidemiology of nosocomial fungal infections, with emphasis on Candida species. Clin Infect Dis 1995;20:1526.
22. Hidron AI, Edwards JR, Patel J, et al. NHSN annual update: antimicrobial-resistant pathogens associated with healthcare-associated infections: annual summary of data reported to the National Healthcare Safety Network at the Centers for Disease Control and Prevention, 2006–2007. Infect Control Hosp Epidemiol 2008;29:996.
23. Classen DC, Evans RS, Pestotnik SL, et al. The timing of prophylactic administration of antibiotics and the risk of surgical-wound infection. N Engl J Med 1992; 326:281.
24. Hawn MT, Richman JS, Vick CC, et al. Timing of surgical antibiotic prophylaxis and the risk of surgical site infection. JAMA Surg 2013;148:649–57. 12 Najjar & Smink Steinberg JP, Braun BI, Hellinger WC, et al. Timing of antimicrobial prophylaxis and the risk of surgical site infection: results from the trial to reduce antimicrobial prophylaxis errors. Ann Surg 2009;250:10–6.
25. Nelson RL, Glenny AM, Song F. Antimicrobial prophylaxis for colorectal surgery. Cochrane Database Syst Rev 2009;(1):CD001181.
26. Englesbe MJ, Brooks L, Kubus J, et al. A statewide assessment of surgical site infection following colectomy: the role of oral antibiotics. Ann Surg 2010;252:514–20.
27. Guenaga KF, Matos D, Wille-Jorgensen P. Mechanical bowel preparation for elective colorectal surgery. Cochrane Database Syst Rev 2011;(9):CD001544.
28. Dahabreh IJ, Steele DW, Shah N, et al. Oral mechanical bowel preparation for colorectal surgery. Comparative effectiveness review No. 128. (Prepared by the Brown University Evidence-Based Practice Center under Contract No. 290-2012-00012-I.). Rockville (MD): Agency for Healthcare Research and Quality; 2014. AHRQ Publication No. 14-EHC018-EF.
29. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med 2009;360:491–9