WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

"STUDY ON USE OF ANTIBIOTICS AS PROPHYLACTIC FOR CLEAN SERGICAL CASES IN A TERTIARY CARE HOSPITAL"

Shinde Rohit Aaba, Mrs. Khamkar S. P

Late Narayandas Bhavandas Chhabada Institute of Pharmacy, Raigaon,Satara Pin code-415020

ABSTRACT:

The aim of the study is to analyze the effectiveness of the prophylactic usage of antibiotic in clean surgical cases asper WHO guidelines in the tertiary care hospital. To study the incidences of prophylactic usage of antibiotic in clean operative surgeries and analyze the deviations if any from the standard procedure established in the hospital. To find if a correlation exists between the frequency of incidences of drug resistance and the type of antimicrobial agent used in clean operative procedure, using post operative infection marker Appropriate antibiotic prophylaxis can reduce the risk of postoperative wound infections, but misuse and overuse of antimicrobials increases both the cost and the selection pressure favouring the emergence of resistant bacteria. Our main objective was to study the pattern of prophylactic antibiotics in different surgeries in a large tertiary care teaching hospital

Introduction:

Surgical antibiotic prophylaxis (SAP) is a very brief course of antibiotics initiated closely before the start of operative procedures to reduce postoperative surgical site infections (SSIs)[1]. SSI is one of the major complications of operative procedures and is also among the most common nosocomial infections [2]. SSI denotes a significant burden in terms of morbidity, mortality and healthcare costs. Guidelines based on high-quality studies had indicated that appropriate surgical antimicrobial prophylaxis is among the effective measures for preventing SSI [4]. For optimal benefit, determining the appropriate indication, selecting agent that covers the likely pathogen on wound contamination, and administering sufficient bactericidal concentrations during the whole period that the incision is open for risk of bacterial contamination is required. Previous studies of antibiotic prophylaxis usage have shown wide variation in compliance to guidelines .Selection, timing andduration of antimicrobial prophylaxis use showed high noncompliance whereas indication and dose were relatively more satisfactory parameters .The variation in practice across different setups could be attributed to the variation in the pub- lished guidelines, the lack of acceptance of the guideline among the surgeons, and the lack of awareness and availability of the guideline to service delivering professionals or setups [6,8]. Including our country, findings from different countries had reported that guideline compliance was poor and thus SAP wasused inappropriately [7–10]. Thus, inappropriate use of surgical antibiotics has to be well-thought-out in order to achieve an overall reduction in morbidity, mortality and healthcare cost.

SURGICAL SITE INFECTION

Infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission is referred to as Hospital-acquired infections (HAI) or nosocomial infection .It also includes infections acquired in the hospital but appearing after discharge,and also occupational infections among staff of the facility. Causative pathogens are usually virus, bacteria or fungi. Blood stream (BSI), respiratory track (ventilator assisted pneumonia), urinary tract (UTI), and surgical site are prominent areas that areprone to HAI. Invasive surgical procedure involves incision of theskin or other body surfaces to reach the surgical site. Post- operative infections of the incisions and the surgical site are generally referred to as surgical site infections (SSIs) and they account for approximately a quarter of all nosocomial infections.[1] SSI occurs even in hospitals with most modern facilities following standardized protocols of preoperative preparationand a practice of using antibiotic prophylaxis as pre-surgical measure.[2]. The frequency with which surgical site infectionoccur vary widely (2.5 to 41.9%) as reportedin medical literature.Type of surgery and underlying patient status are the probable factors that are responsible for such variation.(18, 19, 20). Recent reports by World Health Organization (WHO) reveals " surgical site infection (SSI) is the most surveyed and frequent type of HAI in low- and middle- income countries and affects up to one third of patients who have undergone a surgical procedure. Although SSI incidence islower in high-income countries, it remains the second most frequent type of HAI in Europe and the United States of America (USA).Risk factors for development of SSI may be associated with the preparatory stage, during actual surgicalprocedure or post-surgical conditions. Presence of foreign bodiesincluding drains;

concomitant infection present at other sites; preoperative shaving; surgical team's experience in preoperativedecontamination of body surface and pre-existing local immune response (foreign bodies, damaged tissue or hematoma) have been identified as pre-surgical risk factor for SSI. Suboptimal levelof hand washing, poor barrier precautions, inadequate cleanlinessand sterility of equipment used during surgical procedure andpost-operative care promotes development of SSI. Variability inthe virulence and type of microorganisms, type and location ofsurgical site, type of antimicrobials received by the patient prior to surgery, long exposure of tissue to exogenous conditions(as inprolong surgical procedure), presence of co-morbidity likediabetes or malnutrition, on-going immune suppression therapy(25), for SSI at the stage of actual surgical procedure. Unhygienic environmental conditions in the clinic and ward ; microorganism carried by health care personals who handle multiple number ofpatient (leading to cross infection); untreated infected site in thepatients being in the ward; poorly sterilized ward equipment; fluid accumulations at wound site of patients with microbial growth init; presence of Methicillin Resistant Staphylococus aureus (MRSA)in ward related materials such as mattresses pillows, bedside lockers, nurse call bells and commodes; use of medicaldevices colonized with microbes; and presence of microbes onscissors, cliniciansstethos copes and non-sterilebedpan areimportant post-surgical risk factors . Balance between extent of contamination of the wound site at the end of a surgical procedure and the ability of the host's immune system to respondto the challenge determines the development of SSI.Infection of wounds caused by microorganisms from instruments,theatre environment, traumatic wounds and from organisms thathave gained access to the wound before the skin has sealed post surgically are described as exogenous in nature whereas thoseinfected from microorganisms that have originated from the skinor from an opened viscous of the patient are described asendogenous in nature. SSI caused by microorganisms from a distant source of infection (principally through haematogenousspread) or attached to a prosthesis

Class	Criteria
Clean	Clean: An uninfected operative wound in which no inflammation is encountered and therespiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition,clean wounds are primarily closed and, if necessary, drained with closed drainage.Operative incisional wounds that follow no penetrating (blunt) trauma should be included inthis category if they meet the criteria.
Clean- contaminated	Operative wounds in which the respiratory, alimentary, genital, or urinary tractsare entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in thiscategory, provided no evidence of infection or major break in technique is encountered.
Contaminated	Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, no purulent inflammation is encountered including necrotic tissue without evidence of purulent drainage (e.g., dry gangrene) are included in this category
Dirty	Includes old traumatic wounds with retained devitalized tissue and those thatinvolve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative fieldbefore the operation.

The 'normal' reaction of the body to injuriesincluding surgical interventions is to contain the damage to the tissue, clear the debris at the site of injury, followed by repair. Process of wound healing involves three major overlapping phases, an inflammatory phase, regeneration phase and maturation phase. Process is complex and involves interaction between many types of cells and release of a varietyof biomolecules. Inflammatory phase involves recruitment of Platelets, neutrophils, and macrophages. Fibroblasts along with Macrophages are involved with regenerationand maturation phase. Cytokines, growth factors, carbohydrates and proteins also have a role in wound healing process. They cascaded into the surgical site to participate in wound healing and act within the wound margins and across the wound bed Complications associated with SSI are due to the interference of the microorganism or its metabolites in the wound healing process that can lead to morbidity. Over one-third of postoperative deaths are found to be related, at least in part, to SSI. (11) SSI related non-fatal damages range from trivial wound discharge toa life-threatening condition. Scars poor in quality and spreading, persistent pain, itching, restriction of movement caused by SSI have significant impact on emotional wellbeing .12 Most common microorganism found in cultures from SSI's is Staphylococcus aureus .Enterobacteriaceae and anaerobes in the large bowel may act in synergy to cause SSI in surgeries involving the opening of bowel. Foreign body introduced in prosthetic surgery (for example, a vascular graft after arterial bypass surgery or a prosthetic joint in orthopedic surgery) are known to reduce the number of pathogenic organisms required to cause an SSI. Non-pathogenic organisms such as Staphylococcus epidermis (collagenase-negative staphylococcus)may also cause SSI under such favorable conditions. Many preventive measures to contain the incidences of SSI have been developed. They vary in accordance with the risk associated withthe

class to which the operative wound belongs and cover pre- operative, operative and post-operative phases of surgical interventions. Maintaining sterility of the operation theatre where surgeries are carried out is one of an important measure that is adopted during the course of surgical procedure. Additional practices have been brought into use to minimize microbial burden at operative site during pre and post-surgical period. Removal of colonized microorganisms in and around the site marked for incision, use of prophylactic antimicrobial therapy, minimizing tissue damage to enhance the patient's defenses against infection, maintaining normothermia, preventing post-operative invasion of microorganisms using wound dressings are some of the important additional measures.