Surgical Infections & Rule of Antibiotics

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Data regarding risk factors for surgical procedure and usage of antibiotics are essential to prevent and treat Surgical Site Infections (SSI) [1]. Prophylactic use of antibiotics has been found helpful in reduction of such morbidities. It is a well accepted intervention in numerous surgical procedures as well. However, there are con- traverses with the fact that the medical fraternity administers antibiotics haphazardly. Evidence based guidelines, and boundaries between prophylactic and therapeutic antibiotic administration are often ignored or disregarded. Literature reveals inappropriate antibiotic prophylaxis during early 1970s in majority of hospitalized patients [2,3]. In this context, indication for prophylaxis, and selection and duration of antibiotics were reported to be irrelevant. However, a better understanding and selection of antibiotic prophylaxis gradually developed. Researcher established general principles that addressed adverse effects of prolonged chemoprophylaxis. These principles lead surgeons with a notion that antibiotics are not a substitute for suboptimal outcome [4].

Rate of inappropriate antibiotic administration in elective colorectal surgery was reported to be 73% in nationwide Malaysian survey. The survey also identified area of gap in published national guidelines for antibiotic administration [5]. Although antibiotic prophylaxis is considered important in surgical procedures [6], inappropriate use of antibiotics is however being practiced in 25-50% of general elective surgeries [7-9]. Meanwhile, beside the fact that appendectomy does accompany 1-5% of SSI with it [1,10,11], efficacy of antibiotic prophylaxis in patients undergoing appendectomy has been observed in several randomized and observational studies [12-17]. Findings from these studies suggest that appropriate use of antibiotics may reduce the risk of SSI following appendectomy by 40-60%. Moreover, prophylactic use of antibiotics shortens the hospital stay as well. It is further elaborated that prevention of wound infection is associated with faster return to normal activity after discharge from hospital [18-20].

Preoperative use of antibiotics and surgical technologies are highly valuable aspects of care in major surgical procedures. However, it is emphasized that preventive measures for SSI are more or less unrealistic. This notion is because of certain unchangeable risk factors such as comorbid diseases, prolong hospital stay and type of surgery [18-21]. Hence, a patient should be provided with abolition of all preventable morbidities. It is a well accepted intervention in numerous surgical procedures as well. However, there are con- traverses with the fact that the medical fraternity administers antibiotics haphazardly. Evidence based guidelines, and boundaries between prophylactic and therapeutic antibiotic administration are often ignored or disregarded. Literature reveals inappropriate antibiotic prophylaxis during early 1970s in majority of hospitalized patients [2,3]. In this context, indication for prophylaxis, and selection and duration of antibiotics were reported to be irrelevant. However, a better understanding and selection of antibiotic prophylaxis gradually developed. Researcher established general principles that addressed adverse effects of prolonged chemoprophylaxis. These principles lead surgeons with a notion that antibiotics are not a substitute for suboptimal outcome [4].

The ideal duration of post-operative antibiotics is not clearly defined although most studies report that there is no additional benefit when antibiotic prophylaxis was continued beyond 24 hours [1,15,25-26]. In context of hospital costs related with surgical complications, Dimick and colleagues established that the increased cost was $1398 per patient for infectious complications; $7789 per patient for cardiovascular complications; $52,466 per patient for respiratory complications; and $1810 per patient for thromboembolic complications [27]. However, it seems inappropriate to evaluate antimicrobial use based on cost alone. Inappropriate usage should also bear over- and under-usage of an antibiotic, burden of mortality rate, the resources consumed for development of new chemotherapeutic agents against resistant microorganism [28]. Hence, the exact cost of prophylaxis therapy should be viewed in consideration with above mentioned outcomes.

On the other hand additional length of stay and charges, and increase in mortality rate due to patient safety events in the hospital can be attributed to postoperative complications [29]. Recent analysis of data from the Veterans Health Administration (VA) National Surgical Quality Improvement Project (NSQIP) confirmed that occurrence of any complication within 30 days of postoperative duration reduced median patient survival by 69% [30]. Such immense reduction in survival...
was additionally independent of preoperative patient risk. Therefore, it should be clarified that one cannot determine actual economical impact simply by direct cost analysis methods. Professionals working on health economic policy need to design special research projects that should include outcomes, and direct and indirect costs procedures to evaluate inappropriate antibiotic usage in hospitals.

The inappropriate preoperative use of antibiotics also consumes a significant portion of hospital pharmacy’s expenses for antibiotics. Healthcare professionals are needed to be encouraged to reduce antibiotics usage for prophylaxis in unfortunate settings. This objective could be achieved either by educational programs or by guidelines implementation.

References