

Audit of Antimicrobial Prophylaxis for the Prevention of Surgical Infections: A Call to Action for Antimicrobial Stewardship

Cerrahi İnfeksiyonun Önlenmesinde Antimikrobiyal Profilaksinin Denetlenmesi: Antimikrobiyal Yönetimi İçin Harekete Geçme Çağrısı

Dear Editor,

Surgical site infections (SSIs) are becoming a growing health threat throughout the globe (1,2). The careful administration of antimicrobial prophylaxis (SAP) before surgery is an important strategy for the prevention of SSIs (2). Administration of right antimicrobial in terms of dose, time, route and duration is the critical step for the optimal use of SAP (1-4). It is evident that the unnecessary usage of antimicrobials leads to serious side effects e.g. *Clostridium difficile* infection and the emergence of extended-spectrum β -lactamase (ESBL) producing microorganisms arise due to overuse of broad-spectrum third-generation cephalosporins (5). Furthermore, irrational use of antimicrobials is also responsible for increasing resistance and the cost of therapy (2).

The last updated clinical practice guidelines for antimicrobial prophylaxis in surgery emphasized on the use of SAP according to the following aspects; a) use of narrow-spectrum inexpensive antibiotics, b) single intravenous dose prophylaxis, c) administration of SAP within 60 minutes before the first surgical incision, d) cefazolin is the first drug of choice, however, if there is allergy to β -lactams then vancomycin or clindamycin should be appropriate alternative regime, f) appropriate dose of SAP (4,6).

SSIs are responsible for about one-third of post-operative deaths and 8% of all deaths in the hospitals. Furthermore, it was reported that SAP share one-third of all antimicrobial use in hospitals for the combat of surgical infection (1,2). Considering the importance of

SAP and guidelines adherence, we conducted a study to investigate SAP practices in routinely performed gastro-duodenal/general surgical procedures for the prevention of surgical infections.

A prospective cross-sectional observational study was conducted for 2 months at a teaching hospital, Peshawar, Pakistan, from April 01, 2019 to May 30, 2019. The study was approved from institutional review boards of selected hospital. Consecutive cases of patients aged ≥ 16 years who underwent gastro-duodenal/general surgical procedures, antibiotic use, correct or inappropriate use, combination, dose, route, and duration were investigated. The appropriateness of SAP and its utilization pattern was compared with standard treatment guidelines. World Health Organization Anatomical Therapeutic Classification (WHO/ATC) was also used to report antimicrobials. Descriptive statistics (percentage, frequency) was used for the presentation of results through IBM SPSS Statistics for Windows. Version 22.0 (Statistical Package for the Social Sciences, IBM Corp., Armonk, NY, USA).

A total of 188 eligible surgical cases were investigated during study period. Laparoscopic cholecystectomy (n=41; 21.8%) was the most commonly performed surgery, followed by acute appendectomy (n=34; 18%), inguinal hernia (n=30; 15.9%), colostomy (n=27; 14.3%), small bowel obstruction (n=19; 10.1%), hemorrhoid (n=16; 8.5%), perianal fistula (n=14; 7.4%), mesenteric cyst (n=4; 2.1%), large bowel obstruction (n=2; 1%) and post-operative adhesion (n=1; 0.5%). SAP was prescribed in 85.6% (n=161) of the surgical proce-

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dure, and 14.4% (n=27) had not received SAP. Out of these, 29.8% (n=48) cefazolin (J01DB04: n=26; 16.1%), vancomycin (J01XA01: n=13; 8%), clindamycin (J01FF01: n=9; 5.6%) adhered according to guidelines with respect to correct choice, 96.8% (n=182) for dose, 100% for route and 51.6% (n=97) for the timing of SAP (optimal value 100%). Most patients received ceftriaxone (J01XD04) (n=53; 32.9%) followed by ciprofloxacin (J01MA02) (22; 13.7%) and amoxicillin plus clavulanic acid (J01CR02) (n=17; 10.6%). The remaining 13% (n=21) surgical procedures were managed with other types of antimicrobials.

In conclusion, inappropriate prescribing practices were observed in our study, primarily related to correct choice, timing and misuse of broad-spectrum antimicrobials. Antimicrobial stewardship programmes focus on accurate and careful management of antimicrobial use for the patient safety and control of infections. Therefore, continuous education, implementation of antimicrobial stewardship programmes and evidence-based guidelines are urgently required at the national and global level for the improved patient safety, prevention of infections, antimicrobial misuse and resistance problems.

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Conflicts of Interest

There are no conflicts of interest.

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