

Determining the Pattern of Antibiotics Usage among the Patients Hospitalized to the Teaching Hospitals of Ahvaz

Ahmadi F (MD)^{1,2}- *Nashibi R (MD)^{1,2}- Seniselbachari E (MD)³- RezaiNasab M (MD)³

*Corresponding Email Address: Infectious and Tropical Diseases Research Center, Health research institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Email: Roohangizenashibi@yahoo.com

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Abstract

Introduction: Antibiotics are one of the most important drugs used in treatment. Because of the cost and association of their use with resistance to them, their consumption pattern is important and the first step is to optimize the use of such drugs.

Objective: Since the use of prophylactic antibiotics was also unreasonable and occasionally continued while the patient was hospitalized, the use of such prophylaxies was also considered. We decided to determine the pattern of antibiotic use in the different wards of three educational hospitals of Ahvaz (Golestan, Imam Khomeini and Razi).

Materials and Methods: This study was a descriptive cross-sectional study that evaluated the pattern of antibiotic use in three hospitals of Golestan, Razi and Imam Khomeini (RA) in Ahvaz. 1554 patients were enrolled in three hospitals and items such as age, sex, ward, start and end dates, administration intervals, dosage, and the type of antibiotic used were evaluated. 759 received systemic antibiotics. Antibiotics administration was analyzed separately and completely in hospitals and departments based on DDD / 100 Bed days (consumed per 100 bed occupied days) and the results were evaluated.

Results: 48.8% of the patients received antibiotics, equivalent to 93.9 DDD / 100 Bed days. 90% of the antibiotics were injected and 10% oral. The highest use of antibiotics was in the Golestan Hospital and the lowest in the Razi Hospital. Among the wards, the highest rate was in the infectious ward of the Razi Hospital (226) and the lowest in Neonatal Department of Imam Khomeini Hospital (5.7). The most used antibiotics were first-generation cephalosporins (20%) or 21% of total consumption, and the highest belonged to cefazolin (18).

Conclusion: Antibiotic use in these hospitals was very high, as evaluated, which needs to be reviewed in the light of the association between incorrect use of antibiotics, emerging resistance and increased cost of treatment.

Conflict of interest: non declared

Key words: Antibiotics\ Drug Dosage Calculation

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1. Infectious and Tropical Diseases Research Center, Health research institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

2. Department of infectious Diseases and Tropical medicine , Razi teaching Hospital, Medical school, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

3. Medical School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Extended Abstract

Introduction: Proper use of antibiotics is needed to treat bacterial infections (1). It is estimated that between 25% to 50% of hospitalized patients receive antibiotics, and studies show that 22% to 65% of these prescriptions are inappropriate or inaccurate. (2)

Considering the drug use studies, an identical classification system with the same unit of measurement is necessary, anatomical, therapeutic, chemical, or ATC (Anatomical Therapeutic Chemical) and defined Daily Dose (DDD) Used by the World Health Organization to determine the amount of medication used in hospitals (DDDs / 100 bed days), indicating the DDD of medication consumed per 100 beds per day. (8)

Objective: Since the use of prophylactic antibiotics was also unreasonable and occasionally continued while the patient was hospitalized, the use of such prophylaxes was also considered. We decided to determine the pattern of antibiotic use in the different wards of three educational hospitals of Ahvaz (Golestan, Imam Khomeini and Razi).

Materials and Methods: The present study is a retrospective descriptive study to determine the pattern of antibiotic use in three teaching hospitals of Golestan, Razi and Imam Khomeini. All patient data from wards of each hospital, including age, sex, inpatient ward, systemic antibiotic use or non-use and, if used, type of antibiotic, dose, interval between doses and duration of treatment were extracted from the files and entered into a questionnaire designed for this purpose. Since the dosage used for each antibiotic depends on the type of antibiotic and the disease, the dosage of each antibiotic should be measured in relation to standard dose specific. Usage of the raw values of each antibiotic for comparison with other antibiotics as well as the measurement of overall antibiotic consumption are inappropriate. So the Defined Daily Dose System is recommended by the World Health Organization. To determine DDD, the average maintenance dose of the drug is considered in an adult seventy kilograms throughout the course of the disease. Also, as the amount of antibiotics used in wards depends on the number of hospitalized patients and the length of hospital stay, it is also possible to eliminate the effect of these factors and to allow comparisons between wards and hospitals. Antimicrobial Consumption Index (ACI) (DDDs / 100 bed days) is used to denote the DDD of the medication consumed per 100 beds occupied in the following way: $100 * \text{DDD} / (\text{Bed occupancy percent} * \text{Number of hospital beds} * \text{Duration of study (days)})$

For this purpose, data of different wards including (bed occupancy percentage, number of beds per day, number of beds occupied, etc.) were obtained from the

Hospital Statistics Center at the desired time, ACI for each antibiotic and Descriptive statistics (frequency, mean, etc.) were calculated by SPSS software version 18.

Results: During the study, 1554 patients were discharged from three hospitals, of which 759 (48.8%) received antibiotics during their stay and their data were collected and reviewed. 47.9% were female and 52.1% were male. The mean age, maximum and minimum age of patients were 34 ± 22.4 years, 94 years and one day, respectively. Patients discharged from three hospitals received antibiotics for a total of 5564 days and the mean, median, mode, maximum and minimum antibiotic duration were 3.6, 2, 1, 46 and 1 day, respectively. The percentages of patients who received antibiotics were 48.8% and 64%, 39.5% and 46.5% in Golestan, Razi and Imam Khomeini hospitals, respectively. During the study DDD / 100 bed days of different types of antibiotics were calculated 93.9 in all three hospitals, 10% of which were orally and 90% injectable. Also, the total amounts of use in Golestan, Razi and Imam Khomeini hospitals according to this unit were 121.3, 73 and 81.6, respectively.

In the evaluation of frequency of antibiotic use in Golestan hospital, the highest rate of antibiotic use belonged to orthopedic, trauma, urology, neurosurgery and pediatrics sequentially. In orthopedic ward, first generation cephalosporins, in trauma ward third generation cephalosporins, in urology ward aminoglycosides, in neurosurgery ward glycopeptides and first generation cephalosporins and pediatrics ward third generation cephalosporins were the most frequent uses. At Razi Hospital, the most frequent antibiotic use was in the infectious ward, internal ward, VIP, surgical ward, orthopedic ward and gynecologic ward sequentially, so that the most common antibiotic used in the infectious ward was penicillins, internal ward glycopeptides, VIP first generation cephalosporins. The surgical, orthopedic, and gynecological units used first-generation cephalosporins. At Imam Khomeini Hospital, the highest antibiotic use was obtained in cardiac surgery, urology, surgery, orthopedics, otolaryngology, gynecology, and finally internal medicine, so the most antibiotics used in cardiac surgery were first generation cephalosporins, aminoglycosides urology, third generation cephalosporins surgery, penicillins orthopedics, first generation cephalosporins, otolaryngology first generation cephalosporins, gynecology and obstetrics first generation cephalosporins and internal ward third generation cephalosporins.

In the overall evaluation of all three Golestan, Imam Khomeini and Razi hospitals, Golestan Hospital had the highest antibiotic use and Razi Hospital had the least antibiotic use and overall, the most common antibiotics consumed in all three hospitals, respectively the third generation of cephalosporins, first generation cephalosporins, glycopeptides and aminoglycosides.

Conclusion: The overall antibiotic use in the three hospitals studied was 93.9 DDD / 100 bed days. The amount of antibiotics used in this study was lower than that of domestic studies and higher than that in international studies.

In terms of the type of antibiotic used according to DDD / 100 Bed days, cefazolin (18) was the most commonly used antibiotic during the study.

And finally, the difference in antibiotic prescribing in similar wards of different hospitals, rather than the type of patients, irrational prescriptions were made in wards with high ACI in mind.

The difference in the subgroups of the surgical group is most likely due to continued antibiotic prophylaxis for several days after surgery.

This study showed that antibiotic use in the studied hospitals is unnecessary and undesirable and due to differences in usage patterns of similar wards, similar protocols and policy making in antibiotic use are suggested.

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