ANTIMICROBIAL UTILIZATION IN A HOSPITAL SPECIALIZED IN CARDIOLOGY

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Introduction

Antimicrobial resistance is a global public health problem, and the irrational use of these drugs is one of the main factors associated with this phenomenon. The use in incorrect doses or duration of treatment and improper indications are some of the contributors to the selective pressure of microorganisms and the spread of resistant strains[1,2].

In 2017, ANVISA prepared the National Guideline for the Development of a Program for the Management of the Use of Antimicrobials in Health Services. Prospective and retrospective audits of all prescriptions are presented as strategies for the antimicrobial use management program. For monitoring the program, the use of process and outcome indicators are recommended. Process indicators refer to the use of antimicrobials, such as consumption in Daily Defined Dose (DDD) per 100 bed days, quality of use, for example, the rate of adequate empirical treatments, rate of treatment review after isolation, percentage of adherence to prophylaxis protocols, and empirical treatments. This study aimed to apply those indicators in a specialized hospital without a stewardship program.

Material and Methods

The study was retrospective descriptive with qualitative and quantitative analysis, based on prescriptions from patients hospitalized for more than 24 hours from August 1st to November 30th, 2019, with systemic antimicrobials, excluding antifungal, antiviral, and treatments initiated on terminated after this period, in a hospital specialized in cardiology. The project was approved by both the CEP of the Federal Fluminense University and the National Institute of Cardiology, with CAAE number 335651200.8.0000.5626 and 33565120.8.3001.5722, respectively.

Based on the unit's computerized system records, the consumption data for antimicrobials was expressed through the DDD/100 beds per day.

The microbiological culture and sensibility testing on the first day of treatment were determined by consulting the results of laboratory tests and were used to determine the guided treatments. In the absence of a test or its result, it was determined if it was empiric or prophylactic. Monitoring of empirical prescriptions for verification of de-escalation based on laboratory tests results. Data were tabulated and analyzed using Microsoft Office Excel® and descriptive statistics.

Results and Discussion

During the study period, 10849 prescriptions were analyzed, in which 1975 (18.2%) prescriptions had systemic antimicrobials. After the application of exclusion criteria, a total of 1558 (14.4%) prescriptions were evaluated. The literature describes higher frequencies of prescriptions containing antimicrobials[3,4], which can be explained due to the absence of an emergency unit and the specialized profile of the hospital, and exclusion of the postoperative unit in this study.

The treatments were primarily performed (64.7%) with an antimicrobial, followed by therapies with

two (18.2%) and three (8.0%). AlTawfiq e Al-Houmoud (2020) and Furlan et al. (2020) also identified a prevalence of monotherapy. Meanwhile, Matos et al., 2019 and Saxena et al., 2019, described the dominance of polytherapy. There is greater use of Meropenem, Piperacillin+Tazobactam, Ceftriaxone, Daptomycin, Vancomycin, and Polymyxin B, which aligns with studies conducted worldwide[4,8].

The empirically prescribed antimicrobial was the most frequent, representing 215 (53.1%), followed by prophylactics (24.7%), guided (13.6%), incorrect justification (4,4%) and preexisting diseases (3,3%). Al-Tawfiq e Al-Houmoud (2020) also found a prevalence of empiric treatments, although the prophylactic was the least frequent. The discrepancies are possibly related to the necessity of preventing infections with cardiac repercussions since the cardiological patients already harbors higher risks.

Laboratory tests to identify the microorganism were requested at the time of empirical prescription in 79.5% (171) of cases. In 76 (44.4%), there was a result before the end of therapy. In 52 (68.4%), at least one associated microorganism was identified, and in 24 (31.6%), no microorganisms were identified. Among the ones with a positive culture, 16 (30.8%) were adequate; 18 (34,6%) were incorrect and have been de-escalated; 2 (3,8%) were incorrect and were not de-escalated. At the same time, only 8 (33,3%) of the treatments associated with negative cultures were de-escalated. Mushtaq et al. (2017) presented a greater frequency of empiric inadequacy and fewer corrections. Hamilton et al. (2020) detected a similarly low percentage of suspension or alterations in treatments associated with negative cultures.

Conclusion

The results reinforce the importance of implementing Stewardship programs, even in scenarios with a reasonable quality of use. Retrospective and prospective audits enable even hospitals with a lack of resources to develop antimicrobial usage analyses. Therefore, minimizing the irrational use of antimicrobials and diminishing drugs resistance.

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