Title: RELATIONAL DATABASE FOR URINARY TRACT INFECTIONS ANALYSIS

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Abstract:

In clinical laboratories, the urine culture is one of the microbiological tests most commonly performed. It allows providing local data about the frequency and the diversity of species, as well as the drug susceptibility profile. Due to the complexity of biomedical data, manual analysis is frequently difficult and often impossible. Therefore, this study address the implementation of a relational database as a computational tool for effective organization and analysis of data related to urinary tract infections. From August 2012 to July 2013, data was collected from 570 patients diagnosed at the University Hospital of the Universidade Federal do Rio Grande with urinary tract infections caused by Gram-negative bacilli. Sixty-three variables for each patient were obtained such as demographic characteristics (gender and age), origin of infection (community or hospital), the etiologic agent, antimicrobial susceptibility testing, among others. The collected data was organized into the database developed in the Database Management System PostgreSQL version 9.3. Data analyses were mainly based on SQL language algorithms. Based on these results, the use of the developed database allows the obtainment of descriptive and analytic queries, enabling the extraction of different information as: division of infections by hospital sector, occurrences by microorganisms, type of infection, gender and age of the patient. The analytical queries allowed the identification the most effective antibiotics according to the sex of the patient, the microorganisms, the age of the patient, among others. Furthermore, each query can be executed through a series of filters, for example, results only for females, for multi drug resistance microorganisms, or even for a particular age. This paper presented a relational database as computational tool for storage and analysis related to urinary tract infections. The elaborate modeling allows the development of any type of query, from simple to complex analyzes, thereby assisting in laboratory analysis.

Keywords: urinary tract infections, medical informatics, data analysis