

**TITLE:** DISSEMINATION CONTROL: MAINTENANCE CHALLENGES OF A SURVEILLANCE PROGRAM

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**ABSTRACT:**

Surveillance programs are important tools to control the emergence and dissemination of multidrug-resistant (MDR) bacteria in hospitals. However, in developing nations, the implementation of these programs, particularly those related to detection and control of carbapenem-resistant enterobacteria is a great challenge. The aim of this study is to investigate the increase in the frequency of enterobacteria carrying *bla*<sub>KPC</sub> (EnKPC) genes detected in a surveillance program conducted from March 2011 to April 2017 in a teaching hospital. The surveillance program included the following activities: publication of guidelines, promoting of hand hygiene, isolation of patients colonized or infected with MDR bacteria, including enforcement of contact of precautions and terminal cleaning and disinfection of isolation rooms and surveillance cultures for EnKPC. The phenotypic identification of EnKPC were performed using the automated BD Phoenix™ system. Gene resistance research was performed by using the multiplex polymerase chain reaction method for the *bla*<sub>KPC</sub>, *bla*<sub>NDM</sub> and *bla*<sub>OXA-48</sub> genes. Molecular typing was performed using the enterobacterial repetitive intergenic consensus and repetitive extragenic palindromic. Between 2011 and 2015, the detection of EnKPC was sporadic, not exceeding a monthly frequency of 0.16 (3/48), while in 2016 the frequency was 1.41 (17/12), increasing to 2.0 in the first four months of 2017 (8/4). Molecular analysis revealed the presence of 4 distinct clusters in the different hospital units. Only one cluster, with Dice coefficient >0,93, was prevalent in the medical clinic (40%; 10/25) in the last two years. The distribution of EnKPC in the last two years was surprisingly concentrated from January to April (60% of the cases). In conclusion, the data shows an increase in the frequency of EnKPC in the first four months. These results can possibly be explained, among other factors, by the renewal of temporary hospital staff, the beginning of academic activities, the admission of new residents, and, particularly by infection control practitioners' vacations which influence the compliance of good practices in controlling the dissemination of MDR bacteria.

**Keywords:** surveillance, carbapenem-resistant, resistance gene.

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