Abstract

Introduction: Catheter-related bloodstream infection (CR-BSI) is a significant source for morbidity and mortality and mortality in addition to increased hospital costs. Patients in intensive care units (ICUs) have a greater risk for CR-BSI due to their clinical condition and the common use of central catheters. Although the rate of CR-BSI is high, in most of the cases such infections are preventable. Intervention programs for prevention of CR-BSI by continuous monitoring and control of intravascular central catheters insertion (CCI) may have a key role in reduction of the rate of infections and improvement in patient health care quality and safety in ICU.

Objectives: The purpose of the present study was to determine the rate and the time to the appearance of CR-BSI, and to evaluate the adherence of ICU teams to infection control guidelines during CCI prior to and following an intervention program in ICU patients at the Hadassah Ein-Kerem Medical Center.

Methods: The rate of CR-BSI was determined in 320 patients with central catheters in six adult ICUs during the first period of the study (November 2006 to March 2007). Assessment of adherence to infection control guidelines during CCI was carried out in 40 patients by covert observation. Educational intervention consisted of introduction of new physician guidelines for CCI,
implementing a nurse checklist to ensure adherence to the guidelines, instructional meetings with the heads of the ICUs, lectures for the teams and beginning in the second period of the study, the empowerment of nurses to stop the CCI procedure if a violation of the guidelines was observed. During the third period of the study (September 2007 to January 2008), following the intervention, the rate of CR-BSI was determined in 336 patients with central catheters in the same ICUs. Known observation of adherence to infection control guidelines during CCI were carried out in 60 patients.

**Results:** Following the intervention, a significant reduction in the rate of CR-BSI was observed in the study population from 9.66 to 3.63 infections per 1,000 catheter days with 62.4% risk reduction for CR-BSI, (P<0.001). Improvements were also recorded in the CCI process and rate of compliance of the ICUs team with infection control guidelines. A significant improvement was noted in physician assistant hand hygiene from 39% to 86.7%, (P<0.001).

**Conclusions:** Surveillance plays an important role in control and prevention of CR-BSI. Implementation of a simple and relatively inexpensive intervention reduced the rate of CR-BSI and improved the other outcome measures studied. Performance of intervention programs is recommended in all hospital units to reduce the morbidity, mortality, hospital stay, and lower hospital cost associated with centrally placed vascular catheters.
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