Journal of Hospital Infection (2006) **63**, 399–405

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Infections following major heart surgery in European intensive care units: there is room for improvement (ESGNI 007 Study)

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Received 14 November 2005; accepted 1 March 2006
Available online 15 June 2006

KEYWORDS
Heart surgery;
Nosocomial infection;
Ventilator-associated pneumonia

Summary Patients undergoing major heart surgery (MHS) may be at increased risk for nosocomial infections. To assess the incidence and type of infections in MHS patients in European intensive care units (ICUs) and their quality of care, a questionnaire was sent to a selection of MHS ICUs in Europe. Seventeen hospitals from seven European countries participated. Overall, 53% of the ICUs received patients only for MHS and the other 47% were mixed. During the study period, 11 915 patients underwent MHS and 1181 (9.9%) developed one or more nosocomial infections. Ventilator-associated pneumonia (VAP) was the most common infection [median 3.8%; interquartile range (IQR) 1.8–4.9], followed by surgical wound infection (median 1.6%; IQR 0.8–2.3), catheter-related bloodstream infection (median 1.3%; IQR 0.8–2.1), mediastinitis (median 1.1%; IQR 0.4–1.6), urinary tract infection (median 0.6; IQR 0.4–1.4) and nosocomial endocarditis (median 0.2%; IQR 0.0–0.9). Median mortality was 4.7% (IQR 2.7–8.4) and median infection-related mortality was 1% (IQR 0.5–2.7). Regarding VAP, 18% of the ICUs did not routinely pursue a diagnosis. Microbiological information was quantitative in 35% of cases and exclusively qualitative in 65%

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doi:10.1016/j.jhin.2006.03.007

of cases. An infectious disease specialist was regularly involved in VAP management in only 35% of the ICUs, and the therapeutic approach to VAP involved de-escalation in 59% of the ICUs. MHS ICUs in Europe still have a high rate of postoperative infections. Well-recognized routine practices for the diagnosis and treatment of VAP are not implemented regularly in many European institutions.

Introduction

Data regarding nosocomial infections in European intensive care units (ICUs) have been reported previously.[1,2] However, this information includes patients with different diseases and underlying conditions.

Patients undergoing major heart surgery (MHS) may be at increased risk for nosocomial infections because they are usually older than other ICU patients, need long surgical procedures, and suffer frequent invasive manoeuvres during the postoperative period.[3–5]

However, few studies have addressed the incidence of postoperative infections specifically in patients undergoing MHS. In addition, information from the USA may not be extrapolated to Europe, where the proportion of coronary artery bypass grafts (CABG) is much lower.

The aim of this study was to determine the incidence of nosocomial infections in patients undergoing MHS in Europe during 2001. Particular attention was given to ventilator-associated pneumonia (VAP) and the most common practices related to its diagnosis and treatment.

Materials and methods

This study was a joint venture between the European Study Group of Nosocomial Infections (ESGNI) of the European Society of Clinical Microbiology and Infection Diseases and the European Working Party of Cardiothoracic Intensivists (EWCI). Informed consent was not required from an ethics committee as confidentiality was guaranteed and no interventions were performed.

ESGNI 007 was a voluntary, observational study that was carried out by a standard questionnaire sent to European hospitals employing members of the EWCI. The first block of information requested data regarding the hospital, including: public or private, teaching or non-teaching, total population surveyed, number of beds and number of hospital admissions for 24 h or longer during 2001.

The second block of information addressed data for the ICUs used for postoperative care of MHS patients, including: specific (i.e. at least 95% of beds used by patients undergoing MHS) or mixed care, number of beds available, possibility of isolation of patients with nosocomial infections and number of physicians and nurses. Information regarding the number of patients in 2001 and the types of procedures performed was also requested. The questionnaire also required information regarding the existence of written guidelines for the management of infections in the ICU.

Data referring to infections included: total number of patients with nosocomial-acquired infections, types of infections, overall mortality and infection-related mortality during ICU stay.

The last part of the questionnaire requested data referring to VAP and included: number of episodes during 2001, type of diagnostic sampling, possibility of obtaining immediate microbiological information based on the Gram stain of the respiratory secretions, availability of quantitative microbiological reports, type of help obtained from the microbiology and infectious diseases departments, therapeutic approach to the empirical treatment of VAP and existence of written guidelines for the management of VAP.

Definitions

Definitions of infections and deaths attributable to infection were sent to the participants. Centers for Disease Control and Prevention definitions for infection were used.[6] An attributable death was considered to be one that occurred during the phase of active infection with no other evident cause, or when the attending doctor decided that the death was attributable to infection.

The ICUs were classified as specific (i.e. more than 95% of their beds were used by patients undergoing MHS) or mixed.