Infection control in Indonesian Hospitals

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in
Indonesian hospitals

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INTRODUCTION

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(Multi)resistant bacteria such as methicillin-resistant *Staphylococcus aureus*, vancomycin-resistent enterococci, extended-spectrum betalactamase-producing *Klebsiella pneumoniae*, carbapenem-resistant *Acinetobacter baumannii* and multidrug-resistant *Mycobacterium tuberculosis* are major causes of healthcare-associated infections. Resistant bacteria emerge under the selective pressure of antibiotics and become a healthcare problem whenever they are able to spread and cause infections.

Worldwide, considerable attention is focused on the prevention of the emergence and transmission of resistant bacteria. Member states of the World Health Organization (WHO) were urged by the World Health Assembly (WHA) Resolution of 1998 to develop measures to encourage appropriate and cost-effective use of antibiotics and to improve practices to prevent the transmission of resistant bacteria.[1] WHO stated that each country should develop sustainable systems to monitor resistant pathogens, patterns of antibiotic use and the impact of infection control measures. The WHO Global Strategy for Containment of Antimicrobial Resistance provided a framework for countries and healthcare institutions to address the containment of resistant bacteria.[2] WHO indicated that the battle against antimicrobial resistance should be fought on many fronts: patients and the general community, prescribers, hospitals, national governments and health systems; the administration of antimicrobials to food-animals; drug and vaccine development; pharmaceutical promotion and international aspects of antimicrobial resistance. Education, development and implementation of guidelines, auditing of antibiotic use, adequate microbiological facilities and effective infection control and therapeutic committees are the key elements of the WHO recommendations. The bottom line is that the prevention of antimicrobial resistance is everybody's responsibility: people in the community and patients, but especially all healthcare professionals; physicians when it comes to rational use of antibiotics; all healthcare professionals who are in contact with patients when it comes to carefully applying the rules for infection control and hospital hygiene.

Between September 2000 and 2004 the Antimicrobial Resistance in Indonesia: Prevalence and Prevention (AMRIN) study was performed in Surabaya and Semarang. Inspired by the recommendations of the WHO, the goal of this research project was to address the problem of antimicrobial resistance in intramural and extramural healthcare in Indonesia.

The AMRIN study was a collaborative study of the University of Airlangga, Dr Soetomo Hospital in Surabaya, the Diponegoro University, Dr Kariadi Hospital in Semarang and three Dutch university centres, Leiden University Medical Centre, Erasmus University Medical Centre Rotterdam and Radboud University Medical Centre Nijmegen. The study was financially supported by a SPIN grant from the Dutch Royal Academy of Arts and Sciences.

The AMRIN study investigated the following questions:

1. what is the prevalence and genetic basis of antibiotic resistance among bacteria in the Indonesian population inside and outside hospitals?

2. what is the level and quality of antibiotic usage in the Indonesian population inside and outside hospitals?
3. what is the correlation between antibiotic usage and the development of antimicrobial resistance?
4. does the introduction of guidelines for antimicrobial usage, e.g. prophylaxis, improve the use of antimicrobial drugs in Indonesian hospitals?
5. which time-proven measures for the prevention of the spread of bacteria and nosocomial infections are implemented in Indonesian hospitals?
6. which preventive measures should be given priority in order to optimize infection control in Indonesian hospitals and does introduction of preventive measures improve infection control?

The AMRIN study was carried out in two phases. The first phase was a survey of antimicrobial resistance, antibiotic use and infection control in the present situation. In the second phase intervention studies were performed based on analysis of the findings of the first phase. The aim of the study was to develop a scientifically based, efficient, and standardised programme for the assessment of antimicrobial resistance, antibiotic usage patterns, infection control measures and execution of interventions in Indonesian hospitals.[3] With this 'self-assessment program', Indonesian policy makers, hospital managements and infection control teams can investigate the situation in their own institutions and perform interventions to implement the WHO recommendations.

The present thesis describes the studies on improving infection control that were performed in two hospitals as part of the AMRIN study.

OUTLINE OF THIS THESIS

In **chapter 1** the studies presented in this thesis are put in a broader perspective. An overview of the most important aspects of infection control that are relevant for the study is given, specifically focusing on problems encountered in developing countries.
Chapter 2 describes the results of cross-sectional surveillance of healthcare-associated infections in the Dr. Soetomo and Dr. Kariadi Hospitals. Clinical sepsis, phlebitis, urinary tract infections and surgical site infections as associated risk factors were studied. Because several problems were encountered in performing the surveillance and the number of surgical site infections proved to be considerable, a standardised postoperative follow-up of patients was developed, the results of which are presented in **chapter 3**.
Chapter 4 describes an analysis of associations of recent antibiotic use as well as demographic, socioeconomic, disease-related and healthcare-related determinants with rectal carriage of resistant *Escherichia coli* in the community and in the two hospitals.
In **chapter 5** the results are presented of a questionnaire measuring knowledge, attitude and behaviour of healthcare professionals with respect to six important aspects of infection control: prevention of blood-borne diseases, hand hygiene, personal hygiene and the use of personal protective equipment, urinary catheterisation, care of surgical wounds and intravenous catheterisation. Based on the results of this questionnaire and our observations, we decided to perform an intervention study to improve compliance with standard precautions. The results of this intervention study are presented in **chapter 6.**

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