

POINT PREVALENCE SURVEY OF NOSOCOMIAL INFECTIONS IN UNIVERSITY HOSPITAL IN MARTIN

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Abstract

Nosocomial infections (NI) are a serious problem not only in Slovakia but in all countries. The European Commission decided on their standardized surveillance in the whole European Union. According methodology elaborated by experts from the European Centre for Disease Control and Prevention (ECDC) in Stockholm we performed a point prevalence survey in the University Hospital Martin (UHM). In this article we present the results which show that the prevalence of NI in UHM (5.5 %) is comparable with the average in other European hospitals. In comparison with occurrence of NI (0.64 %) reported through the Epidemiological Information System of the Slovak Republic, our results are 8.5-times higher. The highest point prevalence of NI was found at the Clinic of Hematology and Transfusiology – 7 patients (out of 15 hospitalized) which is 46.7 %. The most common type of NI was sepsis (25.9 %) and urological infection (22.2 %). Based on the results obtained we recommend to continue in international projects of NI surveillance, so that it would be possible to acquire more accurate data on NI prevalence in UHM and do the benchmarking among hospitals in countries of the European Union.

Key words: nosocomial infection, prevalence, University Hospital Martin

INTRODUCTION

A nosocomial infection (NI) is defined in Slovak legislation as an infection of internal or external origin, which occurred in direct relation with hospital stay or healthcare performance in a healthcare facility or social care facility (1).

Centers for Disease Control and Prevention (CDC) in USA defines nosocomial infections as infections which occurred in a healthcare facility, were not present at admission and the patient was not in incubation period of the relevant infection at admission. If incubation period is unknown, an infection is considered nosocomial when occurred later than 48-72 hours after admission to hospital. Infection present at admission can be considered as nosocomial only if it is epidemiologically related to a precedent hospitalization. All other infections are considered as community acquired. The CDC has also specific diagnostic criteria for the infection types. Using these criteria and same methods of surveillance enables mutual comparability of the acquired data (2).

The NI occurrence is watched in Slovakia through an obligatory reporting. Regulation of the Ministry of Health of Slovak Republic No. 553/2007 on requirements for healthcare facilities about health protection, sets for providers of healthcare and for healthcare workers a duty to avoid NI and to register NI in patient records and in a diary of NI, to perform an analysis of NI occurrence and of the reasons of their occurrence and to apply measures to decrease the occurrence, stop spread of NI and prevent them.

The chief doctor of a ward has to inform the Regional Public Health Authority in 48 hours by a written form. If there is an outbreak or clinically serious NI, death or suspicion of death for NI, reporting is performed immediately – personally, by telephone, fax or email. NI outbreak is an incidence of at least three cases of the same NI, which are in epidemiological relationship (3).

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Analysis of occurrence of NI is annually published in the Annual report on activities of public health authorities in the Slovak Republic, published by the Public Health Authority of the Slovak Republic. Through the Regional Public Health Authority in Banská Bystrica the information on NI has been published since 2006 on web pages of the Epidemiological Information System (EPIS), too.

METHODS

We used a point prevalence survey to estimate prevalence of nosocomial infections in University Hospital Martin.

The survey was realized from June 22nd till July 8th, 2010. Performing of the study was approved by the Ethical Committee of the Regional Public Health Authority in Martin.

Collection of data at each ward had to be finished during the same day it started. The maximum length of survey for the whole hospital was set to three weeks. For privacy protection, every patient in the survey was given a code and his/her data were registered in database only under this code.

We used the definitions of different types of NI from the Codebook by ECDC (4).

There were two criteria for the study group. First, regarding the wards – only the acute care wards were included and the long-term care wards were excluded. The second was about patients – all patients admitted to the ward before 8.00 am and not discharged from the ward at the time of the survey were included.

Our team consisted from researchers from the Department of Public Health of the Jessenius Faculty of Medicine, Comenius University, Regional Public Health Authority in Martin and the University Hospital Martin. These visited in three weeks according a set schedule all acute care wards of the hospital and in collaboration with appointed doctors at the wards they assessed data from patient records and registered active nosocomial infections according the definitions used in the survey. We processed and analyzed the results in Microsoft Excel.

RESULTS

There were 495 patients included in the survey, 268 men (54.1 %) and 227 women (45.9 %), with average age 51.5 years (min. 0, max. 89 years). Out of all patients included in the survey, there were 5.5 % patients found with an active NI. The average age of patients with NI was 50 years (min.0, max.85 years). We found NI in 44.4 % of women (12 NI) and in 55.6 % of men (15 NI).

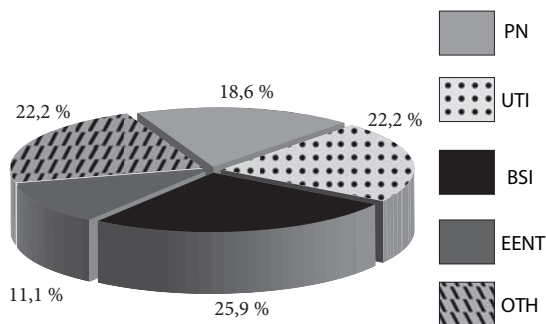


Fig. 1. Prevalence of nosocomial infections at University Hospital Martin Legends for Fig.1 and Fig.5:

PN – Pneumonia; UTI – Urinary tract infection; BSI – Bloodstream infection; EENT – Eye, Ear, Nose or Mouth infection; OTH – other; (according CDC definitions).

The NI prevalence according age groups is on Figure 2.

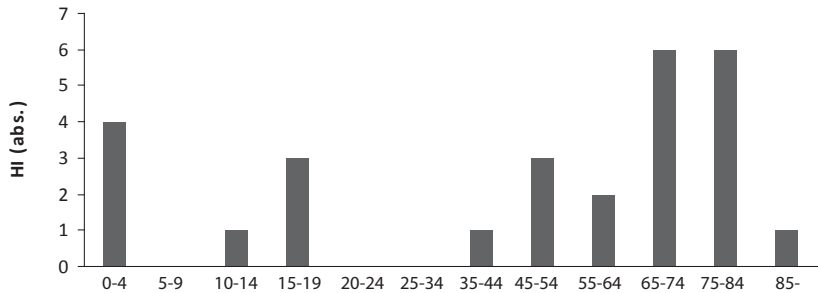


Fig. 2. Prevalence of nosocomial infections according age groups

We present character distribution of NI found at the clinics visited on the following picture.

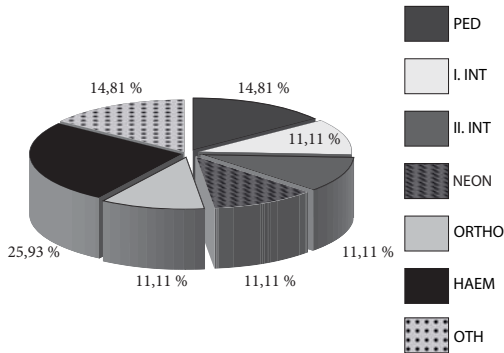


Fig. 3. Proportion of nosocomial infections at clinics of University Hospital Martin

Legends for Fig. 3, Fig. 4 and Fig. 5: PED – Paediatrics; ORTHO – Orthopaedics and Traumatology; I. INT – General Medicine; II. INT – Gastroenterology; NEON – Neonatology; HAEM – Haematology; NEUROL – Neurology; I.SUR - General Surgery; II.SUR – Transplant and Vascular Surgery; OTH – Other.

On Figure 4 there is prevalence of NI at the clinics of UHM. At nine clinics the prevalence of NI was from 2.8 % to 46.7 %. At other clinics there was not found any NI during the survey.

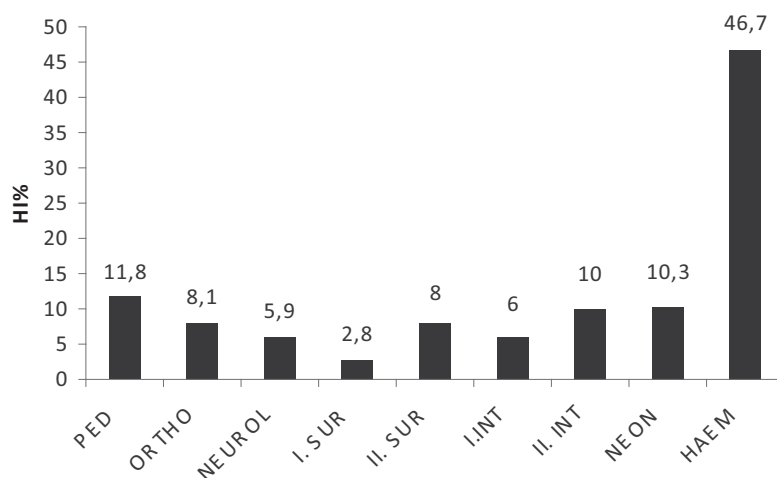


Fig. 4. Prevalence of nosocomial infections at clinics of University Hospital Martin.

On Figure 5 we present character of found NI according clinics of the hospital.

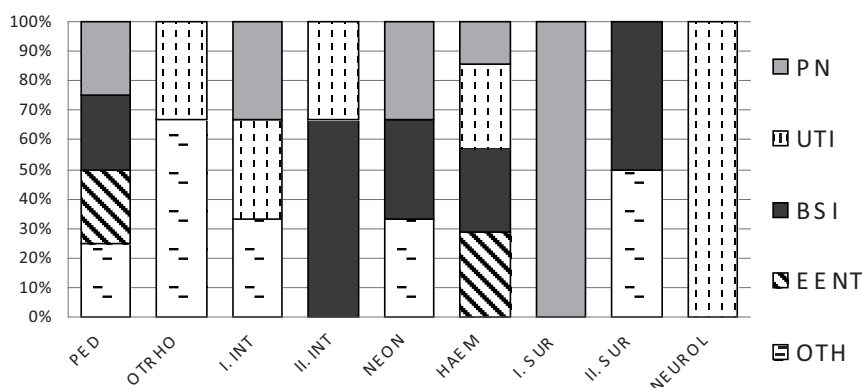


Fig. 5. Character of nosocomial infections at clinics of University Hospital Martin.

DISCUSSION

The European Union put an effort on harmonisation of policies of surveillance of communicable diseases including nosocomial infections. In this context, the EU-funded HELICS project in 1993-2004 undertook a systematic overview of the national surveillance policies and organisation to identify similarities and discrepancies and to plan further progress to be made. Totally, around 2000 European hospitals participate in a surveillance network. The participation is voluntary and the estimated coverage is quite high: around 30 % (5).

Based on the IPSE project (Improving Patient Safety in Europe) in hospitals in the European Union a need was defined for a surveillance of nosocomial infections on European level to estimate and watch the burden of nosocomial infections.

Because a general continuous incidence surveillance is very expensive, the prevalence hospital surveys are considered efficient.

In 2009 the experts from European Centre for Disease Control and Prevention (ECDC) and experts from member states of the European Union elaborated a protocol of the European point prevalence survey (6).

Prevalence here means the number of all cases – new and also old but still present in population. Because this number is counted for a specific date, it is a point prevalence study (7).

Currently, the average NI incidence among hospitalized patients in hospitals in developed countries is about 6-8 %. In less developed countries it is even more than 25 %. Infections, deaths and economic costs related to acquiring NI have been growing mainly in past thirty years. Although estimations of proportion of preventable NI differ, there is a general consent that it could be more than 20 % in developed countries and even more than 40 % from all NI in less developed countries (8).

The biggest proportion of NI was the sepsis (25.9 %). In men it was 33.0 % from all found NI, in women 16.0 %. Then there were urological infections, which occurred in 22.2 %. In men in 20.0 % and in women 25.0 % of all NI. Other infections were found in 22.2 % of all NI. To this group we put the infections of gastrointestinal system, central nervous system, surgical site infections (SSI) and bone and joint infections.

It results from the data from EPIS that in 2009 the most common reported NI were the SSI (22.96 %) and urological infections (20.41 %).

We found most of the NI in the age group of 65-84 years, 12 cases (22.2 %). High number of NI occurred also in children under one year of age – 4 cases (14.8 %). In both these groups there was the highest number of hospitalized patients, too. We think that one of the most important causes underlying the high prevalence in these is the weak immune system.

The highest proportion of NI found at the University Hospital Martin (UHM) was from the Clinic of Hematology and Transfusiology (25.9 %). There occurred all types of serious NI. This was probably due to characteristic weak immune system of the patients hospitalized at the clinic and to an aggressive chemotherapy.

At the Clinic of Children and Adolescents there were 14.8 % of all NI in the hospital and equally 11.1 % at the Clinic of Orthopedics and Traumatology, Clinic of Internal Medicine I, Clinic of Internal Medicine-Gastroenterology and Clinic of Neonatology. Some clinics with lower NI prevalence (Clinic of Neurology, Clinic of Surgery, Clinic of Transplant and Vascular Surgery) represent 14.8 % from total number of found NI. There were no found NI at other clinics. When looking at data from EPIS, the highest number of NI in 2009 was reported from the Clinic of Surgery (25.51 %).

The highest point prevalence - the proportion of NI from the total number of hospitalized patients at a clinic – was at the Clinic of Hematology and Transfusiology: 7 patients (46.7 %). In 2009 there was no NI reported to EPIS from this clinic. We assume that it was due to insufficient reporting. Similarly, in the Annual report on activities of public health authorities in the Slovak Republic in 2009 we may read that the low number of reported NI from all healthcare facilities in Slovakia is probably due to insufficient reporting, too.

At the Clinic of Children and Adolescents we found 4 cases of NI (11.8 %), at Clinic of Neonatology we found 3 NI cases (10.3 %) and at Clinic of Internal Medicine-Gastroenterology 3 NI cases (10.0 %). We found less than 10 % of NI cases among the patients at the Clinic of Orthopedics and Traumatology, Clinic of Neurology, Clinic of Surgery, Clinic of Transplant and Vascular Surgery and Clinic of Internal Medicine I.

Summarizing, the prevalence of NI found in patients at the University Hospital Martin was higher (5.5 %) in comparison with the reported occurrence in the Epidemiological information system where NI represent 0.64 % (9). We are convinced that this is due to insufficient reporting of NI. There could be more reasons for that. Our main assumption is that there is a belief that a higher number of reported NI could lead to a negative assessment of quality of healthcare of the hospital.

However, our results are in accord with data on reported NI in developed countries. Marcel *et al.* (10) state that the prevalence of NI in European hospitals is about 6-12 % (10).

We suggest that the reporting of NI would be improved at the University Hospital Martin and that there would continue the participation in international projects of surveillance of NI and the infection control, so that it would enable benchmarking and consecutive improvement.

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