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LEVEL OF KNOWLEDGE AMONG MEDICAL PERSONNEL ABOUT INFECTIONS TRANSFERRED THROUGH DIRECT CONTACT – RESULTS OF QUESTIONNAIRE SURVEY

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ABSTRACT

INTRODUCTION. Nosocomial infections are an important issue all over the world. The most important vector for transmitting infections in a hospital are the hands of the medical personnel, which is why their adequate hygiene is an essential prevention method.
THE AIM OF THE STUDY was to evaluate the medical personnel's level of knowledge on the prevention of nosocomial infections transferred through direct contact.
MATERIAL AND METHODS. The diagnostic survey method with a proprietary questionnaire was used for the research. The research was conducted between May and June 2013 on a group of 100 randomly chosen medical workers of one of Cracow hospitals (nurses, doctors and paramedics). The age of the interviewees ranged from 23 to 60 years old.
RESULTS. Despite the fact that most of the respondents took part in courses related to nosocomial infections and declared the will to take part in more courses related to this issue, the level of knowledge of the medical personnel on the prevention of nosocomial infections transferred through direct contact and the post-exposure procedures is insufficient. Only 28.0% of the respondents knew that the dominant hand decontamination method according to WHO is disinfection, 22.0% of the surveyed medical personnel admitted that they put covers on needles after they performed the injection and 11.0% of the interviewees mentioned that they change the gloves before contact with the patient only sometimes.
CONCLUSIONS. The surveyed group has not demonstrated a sufficient knowledge of the rules of preventing infections transferred through direct contact and the post-exposure procedures. The level of knowledge of the surveyed medical personnel was dependent on, e.g., years of experience and taking part in courses on nosocomial infections.

Key words: *nosocomial infections, prevention of infections, hand hygiene*

INTRODUCTION

Nowadays, nosocomial infections are one of the worldwide epidemiological, as well as sanitary and hygienic problems, both with regard to health and economy. They increase severity of the illness, contribute to an increase in mortality, as well as prolong the period of hospitalization. Nosocomial infections also include infections which are acquired by a hospital employee while performing his or her professional duties - not only during medical procedures but also while cleaning, removing contaminated waste, transporting patients and contagious material in the laundry. The risk of infection is influenced both by the employee's knowledge, exercised profession, possessed skills, using sterile equipment and protective clothes, observing procedures, as well as the principles of safe removal of medical waste, particularly sharp tools (1).

The source of exogenous nosocomial infections may be microbes coming from another patient (direct way) or existing in the environment surrounding the patient (indirect way). The most frequent source and way of nosocomial infections are hands of the personnel who may transmit microbes from one patient to another

(cross infection) (2). In order to limit the transmission of infections, an important role is performed by correct decontamination of the hand skin and using protective gloves (3). As early as in 1990s, the Centre for Disease Control and Prevention (CDC) acknowledged that the proper hygiene of medical personnel's hands is the most effective and cheapest method of combating the epidemics of infections (4). In accordance with the recommendations of the World Health Organization (WHO), disinfection should be the prevailing method of decontamination of personnel's hands (5).

Preventive vaccinations are one of the basic methods of specific active prevention of infectious diseases. Only in the case of infection with hepatitis B virus, HBV, specific prevention in the form of vaccination is possible (6). An important element of non-specific prevention is safe work, which means, among others, putting waterproof plasters on abrasions and injuries, introducing closed systems for biological sampling, or withdrawing from repeated insertion of covers on needles (7-10). Medical personnel should be protected against infectious factors by proper personal protective equipment, including protective clothes. The clothes are supposed to constitute a barrier for blood and other body fluids, and protect from the penetration of contagia to the body (11). In case of the exposure to a potentially contagious material, an important role is performed by knowledge and the skill of applying adequate post-exposure procedures, the aim of which is the minimization of the germs transmission risk and the prevention against the establishment of the infection. (12).

Shaping the attitude of responsibility for the medical staff's own health, the health of colleagues, as well as of the patients whose care is entrusted to medical personnel, including nursing personnel, takes place on each stage of medical staff training. Medical personnel should have proper theoretical and practical preparation to perform professional tasks safely.

The aim of this paper is the assess the level of medical personnel's knowledge on the prevention of nosocomial infections transferred through direct contact and the principles of post-exposure prevention.

MATERIAL AND METHODS

The survey was conducted from May to June 2013. The respondents were 100 randomly chosen employees of one of Cracow hospitals aged 23 - 60: 73 nurses (73.0%), 15 doctors (15.0%) and 12 paramedics (12.0%).

Great majority of the surveyed group were women (n=91, 91.0%). The respondents were the workers of Intensive Care Unit (n=29, 29.0%), Cardiology with Intensive Therapy (n=26, 26.0%), Traumatic-Orthopedic Surgery Ward (n=24, 24.0%) and Operating Theatre (n=21, 21.0%). The respondents were asked to complete an anonymous survey questionnaire of the author's own structure, including 42 open-ended and closed-ended questions. Some of the questions included socio-demographic data, whereas others concerned content-related issues. The following tests were used for calculations: Kruskal - Wallis, U Mann-Whitney, Chi-square, Spearman's rank correlation coefficient. The results for which the level of significance was less than or equal to 0.05 were assumed statistically significant.

Findings

Among the respondents, persons with secondary (n=45, 45.0%) and higher education (n=43, 43.0%) prevailed, the remaining respondents had vocational education (n=12, 12.0%). 50 interviewees (50.0%) had the title of certified nurse, 20 (20.0%) had Licenciate in Nursing, 13 (13.0%) had professional title of Master Nurse, and 17 survey participants (17.0%) had the title of medical doctor.

An analysis of the obtained results proved that the level of the respondents' knowledge on infections transferred through direct contact and post-exposure prevention was insufficient (Table 1).

The majority of the medical personnel, as many as 89 interviewees (89.0%), participated before in at least one training course on nosocomial infections. The biggest number of the respondents, 46 (46.0%) took part in such a course more than 2 years ago, 19 respondents (19.0%) a year ago, 19 (19.0%) did not remember the date, whereas 16 interviewees (16.0%) were the participants of a training course last year. Also a considerable number of the survey participants, 76 respondents (76.0%), declared previous participation in some training on post-exposure procedures on body sampling. The majority of the respondents took part in this type of training over two years ago (n=37, 37.0%), 35 (35.0%) did not remember the date, 17 respondents (17.0%) participated in a training course last year, and 11 (11.0%) did over a year ago. The surveyed group declared a wish to participate in training on nosocomial infections at the frequency of two (n=93, 93.0%) or three courses a year (n=7, 7.0%). The need for a larger number of courses on nosocomial infections did not depend on the education of the respondents (p=0.96375). Regardless of the time which passed from the last training course on nosocomial infections, the respondents' knowledge was on a similar level (p=0.7899). It was also proven that the respondents who participated in training on nosocomial infections showed a higher level of knowledge than the interviewees who did not take part in such training before (p=0.005595).

The knowledge of post-exposure procedures with blood and potentially contagious material was declared

by 93 interviewees (93.0%). The majority of the medical personnel assessed their knowledge of post-exposure procedures as good (n=66, 66.0%), 31 survey participants (31.0%) as poor, 2 (2.0%) as very good, and 1 person did not have any knowledge of it, in his/her opinion. No statistically significant relationship between the subjective assessment of one's own knowledge and the real level of knowledge of post-exposure prevention and the prevention against infections transferred through direct contact (p=0.1692) was found.

As many as 63 respondents (63.0%) could not correctly indicate the dates of the next blood tests of a person exposed to potentially contagious biological sampling. The awareness of the existence of active prevention against HBV virus group was revealed by as many as 61 respondents (61.0%). Only 23 interviewees knew the minimum level of anti-HBs antibodies protecting against hepatitis B virus. Few respondents could mention the least amount of blood which may be the source of infection with HBV and HCV (7.0% and 13%, respectively). A little more, 34 interviewees (34.0%) knew what amount of blood can cause human immunodeficiency virus (HIV) infection.

The knowledge of blood drawing procedures was declared by 74 survey participants (74.0%). Only 40 respondents (40.0%) knew that vein palpation is correctly performed before disinfection in protective gloves. A considerable part of the respondents, 22 interviewees (22.0%) admitted that they put covers on needles after making an injection. As many as 13 respondents (13.0%) indicated that only sometimes or rarely they change gloves before contact with the next patient. The use of personal protective equipment was declared by 97 respondents (97.0%). In the opinion of as many as 31 interviewees (31.0%), there was a frequent shortage of protective gloves at their work stand, 28 (28.0%) said that they are sometimes missing, and for 41 respondents (41.0%) they are accessible without any limitations all the time.

Only 32 respondents (32.0%) knew how long they should wait after skin disinfection with disinfecting agent before making an injection. Few respondents were aware (n=28, 28.0%) that disinfection is the method of hand contamination recommended by WHO. The necessity to apply contact isolation in the case of discovering infection with *Clostridium difficile, Enterococcus faecium, Staphylococcus aureus* was known respectively to: 18 (18.0%), 35 (35.0%) and 25 respondents (25.0%).

The biggest number of interviewees in the surveyed group, 36 (36.0%), was in the profession for 15-20 years, for 29 (29.0%) the job seniority was 5-15 years, for 20 (20.0%) up to 5 years, and for the remaining 15 respondents (15.0%) it was 20-35 years. It was proven that the longer seniority of medical staff, the higher level of knowledge on post-exposure procedures and the prevention of infections transferred through direct contact (p=0.011851).

The highest level of knowledge was revealed by employees with higher or secondary education, the lowest one by the respondents with vocational education ($p<0.0001$). Moreover, it was discovered that the lowest level of knowledge was possessed by the respondents with the professional title of medical doctor, whereas the level of knowledge of the survey participants with the professional title of Master Nurse, Licenciate in Nursing or certified nurse was similar ($p<0.0001$) (Fig. 1).

DISCUSSION

The level of knowledge on the prevention of infections and the application of adequate methods in medical procedures is an important element influencing both the health and life of patients and the working medical personnel (13). Despite the growth of the education level and gaining higher qualifications by medical staff, the knowledge on nosocomial infections is still too low. This paper proves that despite the participation of majority of the respondents (89.0%) in training on nosocomial infections, the level of medical personnel's knowledge on that was insufficient.

The survey conducted by *Garus-Pakowska and Szatko* proved that bigger knowledge was possessed by nurses who took part in training on the prevention of infections and demonstrations of proper hygiene of hands over the last year (13). On the other hand, the analysis of the author's own survey did not show a relationship between the level of knowledge and the time which passed from the last course. The respondents who participated in this type of training revealed a higher level of knowledge than the interviewees who did not take part in this type of training so far.

Owłasiuk and Litwiejko claim that the most frequent cause of not using gloves by medical personnel is their wrong size (37.2%). Among other mentioned factors there was, among others, the shortage or an insufficient number of protective gloves (14.4%) (1). An analysis of the author's own survey revealed an alarming fact - only 41.0% of the respondents mentioned the lack of limitations in the access to protective gloves in the workplace.

What results from the research conducted by *Garus-Pakowska* is that the level of using gloves in accordance with the procedures was estimated at 50.0%. An observable small percent of washing hands before the contact with a patient, as well as the repeated usage of protective gloves for contacts with other patients suggests that hand hygiene in the eyes of medical personnel is more important from the point of view of the employee himself/herself than patients (4). In the author's own survey it was proven that as many as 13.0% of the respondents

only sometimes or rarely changed gloves before contact with another patient.

The repeated insertion of covers on the used needle after making an injection increases the risk of prick. As many as 22.0% of the respondents admitted using such practices. *Owłasiuk and Litwiejko* give similar example: 59.3% of the survey participants put the cover on the needle after making an injection, 18.6% did it frequently and 15.8% did it always or usually. The majority of the respondents did not give any reason for their behaviour (1).

Kosonóg and Gotlib in their research into the observance of asepsis and antisepsis in selected procedures proved that over a half, namely 60.0% of the respondents knew how long they should wait after skin disinfection with disinfecting agent before making an injection (3). A little different results were obtained in this survey: only 32.0% of the respondents gave the correct answer to this question.

Nurses, as interviewees taking direct care of the patients are responsible for their health, and are the professional group which is particularly exposed to infections. The majority of medical personnel understand the necessity to observe the principles of hygiene and antisepsis but they often do not apply them. A positive aspect in the hospital personnel's attitude is the fact that the great majority of them feel the need for further education and development of their knowledge by participating in training courses. Therefore, it seems advisable to implement a larger number of courses on nosocomial infections.

CONCLUSIONS

1. The level of knowledge on the prevention of infections transferred through direct contact and post-exposure procedures depended on job seniority, education and the academic degree of the respondents. No relationship between the level of knowledge and the time which passed from the last course was found.
2. The respondents who participated in some training on nosocomial proved a higher level of knowledge than interviewees who were never trained on that.
3. The respondents declared a wish to participate in future courses on nosocomial infections.
4. The surveyed group did not prove sufficient knowledge on the principles of the prevention against infections transferred through direct contact.

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