



Original research

How and how much do endoscopy professionals protect themselves against infection?



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ABSTRACT

Purpose: It is aimed to identify, the educations given to professionals working in endoscopy units against infectious risks during the endoscopic procedures and awareness of professionals for protection from these infections.

Material and method: After obtaining the required ethic committee permissions, 50 physicians and 34 nurses, working in the endoscopy units of three university and one training and research hospital, were included in this study. A survey with 37 questions, prepared in accordance with the literature was applied to the participating endoscopist (E) and endoscopy nurses (EN). SPSS (Statistical Package for Social Sciences) for Windows 16.0 program was used for statistical evaluation of the obtained data.

Findings: Forty-four (52%) of the subjects were female and 40 (48%) were male, and their average age was 39 (± 6.82) years. When trainings on endoscopy of E and EN were evaluated, it was found that 44% ($n = 37$) of them precise an endoscopy course on endoscopy training, %56 ($n = 47$) received no training and they learned through master/apprentice system. Furthermore, it was found that 65% ($n = 55$) of the E and EN received no training on universal precautions procedures, infection and risks endoscopic procedures and only 35% ($n = 29$) received a specific course or on-the-job training. Nevertheless, rates of wearing protective gowns and gloves were high both for E and EN; but rate of other precautions such as wearing mask, using special gloves and face shields were found to be low. It was found that the rate of “receiving an education on endoscopy” for E was significantly higher than that of EN ($p < 0.001$). The rate of reporting emergency situations such as contact with blood/body fluids or percutaneous injuries and the rate of taking universal precautions of EN who received an education, was statistically higher than that of EN who did not ($p < 0.001$ and $p < 0.008$).

Results: As a result of our investigation, it was determined that the endoscopists and endoscopy nurses did not effectively apply the universal precautions against infectious risks faced during endoscopic procedures and did not receive the basic trainings. The professionals who received training were more responsive for this issue. According to our results, organizing continuous training programs through endoscopy professionals is necessary to provide the universal precautions of avoiding exposure to blood and body fluids.

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1. Introduction

Contemporary, endoscopic applications for gastrointestinal system are frequently applied both for diagnosis and treatment. Endoscopist (E) and endoscopy nurses (EN) are exposed to patient

body fluids either during endoscopy procedures or after the procedure when the tools are being prepared (disinfection-reprocessing) [1,2]. Therefore, they are under the infection risk of hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV), *Mycobacterium tuberculosis* (*M. tuberculosis*), *Helicobacter pylori*, herpes simplex and other enteric pathogens [3–5]. Hence, it is recommended in many regulations that all endoscopy professionals shall be trained on protection from the infections that can be contracted from blood and other potential infectious materials, and they shall use personal equipment [6–8]. Our study was planned in order to determine the trainings given to physicians and nurses working in

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endoscopy units, and also to determine the applications and responsiveness about this issue, and to provide guidance for the required precautions that shall be taken.

2. Material and method

This study was carried out in the endoscopy units of Istanbul University Istanbul Medical Faculty Hospital, Istanbul University Cerrahpaşa Medical Faculty, Istanbul Training and Research Hospital and Bezm-i Alem Valide Sultan Foundation Hospital. Necessary documents were prepared and permissions were obtained from the ethic committees of these centers. Before start up, purpose and benefits of the study were explained to E and EN. Fifty physicians and 34 nurses, who were voluntary, were participated the study. Data was collected from a survey, including 37 questions which were prepared in accordance with the literature. SPSS (Statistical Package for Social Sciences) for Windows 16.0 program was used for statistical evaluation of the collected data. In addition to statistical methods (number, percentage, average and standard deviation), Chi-square and Fisher's Exact Chi-Square tests were used in comparison of qualitative data. Results were evaluated in 95% confidence interval, significance was taken as $p < 0.05$.

3. Results

Average age of E and EN was $39 (\pm 68)$. 44 were female (%52) and 40 were (%48) male. Median time of the experience in the endoscopy units was 6 years (1–22). More than 60% of the subjects were under 40 year-old ($n = 51$). In addition to this, the working duration of 50% of the subjects in the endoscopy unit w below 5 years, and 20% of them had been working in the endoscopy unit more than 10 years (Table 1).

When the number of daily procedures for the participating E and EN were considered, it was determined that nearly 30% of them were involved in 10–20, %25 in 20–30, and 20% of them in more than 30 procedures and only 20% of them less than 10 procedures per day.

When training on endoscopy of E and EN was evaluated, it was identified that 44% of them ($n = 37$) received a course training on endoscopy, and 56% ($n = 47$) received no special education and learned endoscopic procedures by masterapprentice relationship. It was also identified that 65% ($n = 55$) of them received no education on universal precautions and infectious risks faced during endoscopic procedures, in the other hand 35% of them ($n = 29$) received a course or on-the-job training.

The rate of “always wearing a gown” was 90% for E and 75% for EN; the rate of “wearing a glove” was 98% for E and 100% for EN. Ten

percent of E w always, 32% w sometimes wearing a mask. These rates were 32% and 41% for EN. Fifteen percent of EN w always wearing goggles and 20% sometimes, same rates were 4% and 26% for the physicians respectively. When gown changing was elaborated, 54% of E and 62% of EN reported that they did not change gowns until they got dirty. Most of E and EN (85% and 71%) reported that they were using a needle to remove the biopsy sample from forceps. The rates of working when they were suffering an exudative skin lesion or dermatitis were 38% and 70% for E and EN respectively. The rates of vaccination against HBV for E and EN were 80% and 82%.

Eighty-eight percent of E and 61% of EN reported that they take universal precautions during the endoscopic procedures. Details of the precautions taken for protecting from infections during endoscopic procedures by the endoscopist and endoscopy nurses were given in Table 2.

Thirty-five (69%) of E and 9 (26%) of EN reported that they had received a special education program on endoscopy. The rate of “receiving training on endoscopy” of E was significantly higher than that of EN ($p < 0.001$). No difference was found between the E and EN in terms of receiving education on universal precautions, risk of infections and protection methods during endoscopic procedures (33% vs. 36%, $p = 0.752$).

The vast majority of E (91%), who were trained on “universal precautions and the risks facing professionals in endoscopy and protection methods” promptly, report the situations of contacting with blood/body fluid of patients or percutaneous injuries. Seventy-nine percent of E, who did not receive any training on this issue stated that they did not report. The rate of reporting a contact with blood/body fluid of patients or percutaneous injuries of EN who received training was significantly higher than that of EN who did not receive any training ($p < 0.001$, Fig. 1).

91% of EN who were trained in “universal precautions and risks facing professionals in endoscopy and protection methods” were taking precautions, it was 9% of EN who did not receive any training. The difference was statistically significant ($p < 0.008$, Fig. 2).

When the precautions were evaluated, 55% of EN reported that they were using mask during procedures, however this rate dropped to 15% for E ($p = 0.048$). The rate of working while they had an exudative skin lesion or dermatitis was 40% for E ($n = 19$) and 70% for EN ($n = 24$) ($p = 0.025$). 88% of E and 61% of EN reported to take precautions ($p = 0.016$) (Table 3).

4. Discussion

Contemporary, endoscopic applications are frequently applied, both for diagnosis and treatment purposes, in gastrointestinal system, bile ducts or pancreatic diseases. In the United States more than 20 million of gastrointestinal endoscopy procedures per year are applied [9]. Endoscopy professionals are at risk of chemicals, body fluids contamination of patients, exposure of radiation and muscle skeleton injuries [1,2,10].

The rate of contracting an infection, during a gastrointestinal endoscopic procedure is reported to be 1/1.8 million operations [11]. Reported infections are Hepatitis B virus (HBV), Human Immunodeficiency Virus (HIV), *Mycobacterium tuberculosis* (*M. tuberculosis*), *H pylori*, Herpes simplex and enteric pathogens [3–5]. A study from USA reported that 1.6% of population were infected with HCV and half of them did not know this situation [11,12]. Hence, it is emphasized that all patients have to be considered as infected and disinfection of endoscopic tools is mandatory for reuse [6]. Such as patients, E and EN are under a risk of infections, both during the procedure and after that when the tools are being prepared for the new one (disinfection-reprocessing) [2,4,10,13,14]. For

Table 1
Socio-demographic characteristics.

Average age $\pm$ standard deviation	39 $\pm$ 6.82 years	
	Number ($n = 84$)	Percentage (%)
≤ 30	12	14
31–35	11	13
36–40	28	33
41–45	15	18
46–50	14	17
>50	4	5
Gender		
Female	44	52
Male	40	48
Median working duration(year)	6 (1–22)	
1–5	40	48
6–10	27	32
11–15	13	15
>15	4	5

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