



Original Article

Blood and body fluids: knowledge, attitude and practice of medical students in Ajman, UAE

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Abstract:

The health care workers should be aware of Universal Work Precaution (UWP) as there is an increased risk of exposure to infectious diseases which is considered mainly due to accidental exposure to blood and body fluids.

This study mainly aims to evaluate the knowledge, attitude and practice of medical students on blood and body fluids at Gulf Medical University, Ajman, United Arab Emirates (UAE).

The study subjects constituted 212 medical students of academic years 2005 – 2009. A self administered questionnaire was utilized for data collection and analysis was performed using statistical software PASW 17. Results: The participant's age ranged from 17 to 27 years. A statistically significant association ($P < 0.001$) between knowledge on UWP and year of study was observed, with a highest knowledge of 95.5% in third year, 88% fifth year, 82.5% fourth year, 67.3% second year and a lowest of 33.3% in first year. A statistically significant association was obtained between knowledge and practice ($P < 0.01$) of medical students regarding needle recapping. The study reported, that a majority of participants with the opinion on wearing surgical aprons, masks and protective goggles during surgery while the practice was not up to the level of knowledge. Statistically significant association was obtained between knowledge and practice ($P < 0.01$) with regard to the usage of surgical aprons and protective goggles.

The present study thus indicates an increase in practice with increase in knowledge. The study also emphasizes the need for providing proper education on transmission of blood-borne infections, standard precautions and increasing availability of protection strategies.

Key Words: Universal Work Precaution; Knowledge; Medical students.

Introduction

Exposure to infectious diseases in the health care settings is one of the recurrently recognized public health issue faced by health care workers [1]. Health care workers (HCW) at hospitals provide care for all patients including patients whose hepatitis B virus (HBV) or human immunodeficiency virus (HIV) status is unknown [2]. Blood borne infections (BBIs) are a major

concern for all health care workers for transmission of HBV, hepatitis C virus (HCV), and HIV possibly through percutaneous injury such as needle stick injury, cut with a sharp object, or contact of mucous membrane or non intact skin with blood, tissue, or other potentially infectious body fluids [3]. The risk of occupational infection by blood borne pathogens (BBPs) in HCWs is mainly due to accidental exposure to blood and body fluids. More than 50 different pathogens have been known to be transmitted in occupational blood borne infections [4]. Infection transmission risk on percutaneous exposure to infected blood varies according to the specific blood borne pathogen. For HBV,

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this risk can be up to 30% depending on the presence of various serological markers in the blood of the patient. The transmission rate is around 3-4% for HCV and 0.3% for HIV [5].

HBV and HCV infections are the biggest health challenges of the developing world today. Globally, an estimate of one-third of the population has been infected with HBV, approximately 350 million people are lifelong carriers and 170 million individuals worldwide are estimated to be infected from HCV [6]. According to UNAIDS reports 2006, around 39 million people worldwide are living with HIV [7]. Globally, 5.4% of HIV infection is transmitted through unsafe injection practices [8]. World Health Report of November 2002 stated that 2.5% HIV and 40% Hepatitis B and C cases among health care workers occurred mainly as a result of occupational exposure to blood borne pathogens [9]. Incidents from USA and UK report an annual estimation of 600,000 to 800,000 percutaneous injuries and 100,000 to 200,000 mucocutaneous blood and body fluid exposure [3, 10]. Exposure to HIV by health care workers is common in developing countries. Thirteen percent of the health care workers in South Africa reported accidental exposure on handling HIV positive patients [11]. 3.1% of the population of the Islamic Republic of Iran were carriers of HBV, 30%–50% of the population have evidence of previous infection with the virus and 0.3- 0.5% risk of infection with HIV after occupational percutaneous exposure to HIV contaminated blood [12].

Since it is unable to identify all patients infected with HIV and other blood borne pathogens by medical history and examination, the United States Centers for Disease Control and prevention (CDC) has proposed a series of procedures termed universal work precautions to be followed by all HCWs on dealing with all patients to create a safer environment in their work place [13]. Universal precautions are designed to prevent health care workers being exposed to blood and body fluids through basic principle of infection control such as hand washing, utilization of appropriate protective barriers, such as gloves, mask, gown and eyewear, and safe handling of needles. Health care organizations should take up the responsibility of protecting the health care workers from potential dangers [14].

Medical students lack experience and skill and are; therefore, at a higher risk of infection from unsafe practices [15]. In certain aspects on Universal Work Precautions (UWP) medical students were less knowledgeable than health care providers. This is mainly due to lack of systematic programme of education about universal precautions during clinical practice [16]. The present

study was conducted to assess the knowledge, attitude and practice of medical students on blood and body fluids in a tertiary care hospital in Ajman, United Arab Emirates (UAE).

Methods

This study was conducted among five batches of medical students of academic years 2005 - 2009, from February to November 2009 at Gulf Medical University, Ajman, UAE. A total of 212 students were included in the study group showing a response rate of 67% among all year medical students. The students were provided with information on the purpose of the study and made to fill the questionnaire at the end of their regular class period. The questionnaire contained information such as socio-demographic characteristics, year of study, knowledge, attitude and practice regarding blood and body fluids. The questionnaire also contained a consent form pledging confidentiality of the information provided. The data collected was fed into excel sheet and analysed using PASW 17 (IBM, Chicago, Illinois). Association between variables was tested using Pearson's chi-square test. A p-value of 0.05 or less was considered statistically significant.

Results

The study subjects included 212 medical students of Gulf Medical University, Ajman, UAE. Regarding the knowledge on UWP with year of study a highest knowledge of 95.5% were seen in third year, 88% fifth year, 82.5% fourth year, 67.3% second year and a lowest of 33.3% in first year. The association was statistically significant ($P < 0.001$). Knowledge increases with progress in the year of study and reaches a maximum in the third year and then starts decreasing.

Among total participants 55.2% opined that on injury by needle pricks it is necessary to bleed by squeezing. 84.4% favored the necessity of washing thoroughly with soap and water on getting injured with sharps, and 71.2% were with the opinion of providing waterproof dressing on injury. Majority (95.3%) of respondents considered rinsing eyes or mouth with plenty of water on occurring splashes of blood or body fluids as important first aid and 13.7% participants had the incident of splashes of blood and body fluids either in the eyes or mouth. Length of sleeve determines the protection against blood and body fluids was opined by 89.6% subjects.

A response rate of 96.2% (204) was obtained on evaluating the awareness of the students on using a syringe or any other

sharps. 60.8% answered as to recap and then dispose the syringe or sharps after use, 37.7% just dispose it and only 1.5% reuse syringes or sharps. Among the respondents 95.4% opined to dispose sharps in a closed puncture resistant basket. 7.5% participants failed to put forward their opinion on disposal of sharps. 94.3% participants viewed it necessary to wear surgical aprons while performing surgery whereas 93.9% stated wearing masks necessary during surgery and 82.5% opined wearing protective goggles as essential to prevent exposure to blood and body fluids. Of the total respondents 42.9% opined that needles should be recapped by single hand and 50% were with the outlook that both the hands should be used for recapping the needles. On practice 36.3% participants used single hand while 50.9% utilized both the hands for recapping the needles. Among the study subjects 92% opined that it is necessary to be aware of UWP to prevent infections from blood and body fluids.

Among the respondents 73.6% always wore surgical aprons, 6.6% used it occasionally while 19.8% never practiced wearing surgical aprons during surgery. 76.4% participants wear masks always during surgery, 5.2% used masks occasionally and 18.4% never used masks. On evaluating the practice of wearing protective goggles it was found that 47.2% used it always, 16.5% wore occasionally and 36.3% never utilized protective goggles in the operation theatre. The details are shown in Table 1.

Table 1 Practice in the Operation theatre.

Variables	Always		Occasionally		Never	
	No	%	No	%	No	%
Use of surgical aprons	156	73.6	14	6.6	42	19.8
Use of masks	162	76.4	11	5.2	39	18.4
Use of protective goggles	100	47.2	35	16.5	77	36.3

Of the respondents with knowledge on recapping needles with single hand 11.9% did not bring it to practice and among who had no knowledge, 3% practiced. A statistically significant association was observed between knowledge and practice ($P < 0.01$) on needle recapping.

Of the participants who were aware of use of surgical aprons during surgery, 16% did not practice it and 6.5% practiced occasionally and among subjects without knowledge, 8.3% practiced regularly. The association observed was statistically significant ($P < 0.001$).

Of the total participants who had a positive opinion on wearing masks during surgery, 14.6% practiced regularly and 5% occasionally and among the unaware group 15.4% practiced wearing masks regularly during surgery. A statistically significant ($P < 0.001$) association observed between attitude and practice with regard to the use of mask.

Eighty three percent respondents were aware of the use of protective goggles, while in practice, 25.7% do not use protective goggles during surgery. Among those who had no knowledge, 5.4% regularly used protective goggles during surgery. A statistical significant ($P < 0.001$) association was observed between knowledge and practice with regard to use of goggles. The details are given in Table 2.

Table 2 Association between Knowledge and Practice.

Practice		Knowledge				P value
		Yes		No		
		No	%	No	%	
Practice on re-capping sharps by single hand	Yes	74	88.1	3	3.0	<0.01
	No	10	11.9	98	97.0	
Practice on use of surgical aprons	Always	155	77.5	1	8.3	<0.01
	Occasionally/ Never	45	22.5	11	91.7	
Practice on use of masks	Always	160	80.4	2	15.4	<0.01
	Occasionally/ Never	39	19.6	11	84.6	
Practice on use of protective goggles	Always	98	56.0	2	5.4	<0.01
	Occasionally/ Never	77	44	35	94.6	

In any needle stick injury, first year students 78.4% were with the opinion to cover with water proof dressing and only 45.1% to bleed by squeezing the injury.

Ninety two percent of first year subjects opined that rinsing eyes or mouth with plenty of running water on occurring splashes of blood or body fluids, 60.4% were with a positive response on recapping and disposing the syringes or any other sharps after use.

Majority of (93.6%) first year students opined that puncture resistant basket should be used for disposing sharps. Among the first year participants 92.2% were with a positive response on the importance of wearing surgical aprons and masks during surgery and 84.3% were in favor of the requirement of UWP knowledge for preventing blood-borne infection.

Among second year students 46.2% opined that injury should be squeezed to bleed, 96.2% were with a positive response on

rinsing eyes and mouth with running water on splashes of blood and body fluids and 94.2% supported on the necessity of UWP knowledge to prevent blood borne infection. All second year students were with negative opinion on reuse of syringes and other sharps and on disposing sharps by throwing it on the ground.

Among third year students, 65.9% opined both squeeze the injury to bleed and cover with water proof dressing. A majority (95.5%) of third year students opined rinsing eyes and mouth on splashes of blood and body fluids and 95.5% opined wearing surgical aprons and masks while doing surgery. None of the third year students agreed on the reuse of syringes and sharps. Ninety three percent third year students opined that UWP knowledge is necessary to prevent blood borne infection.

Among fourth year students 87.5% were with the opinion that injury should be washed with soap and water and 95% opined that rinse eyes and mouth with water if splashes of blood and body fluid occurs. All fourth year students disagreed with regard to indiscriminate disposal of sharps.

All fifth year students opined that it is important to wash thoroughly with soap and water if there is an injury, rinse eyes and mouth with water on splashes of blood and body fluids, and wear surgical aprons and masks during surgery. Among fifth year study subjects 91.7% opined that used sharp items should be disposed in a closed puncture resistant basket. Ninety six percent participants reported the importance of having UWP knowledge in prevention of diseases due to blood and body fluids.

Discussion

The most frequently occurring occupational hazard among health care workers is the exposure to infectious diseases [1]. The risk of acquiring occupational infection among health care workers from all sources in the health care settings could be reduced by undertaking standard precautions [17-18]. An increase in knowledge and attitude among health care workers will not guarantee protection but it is along with the practice of UWP that helps in infection control in the health care setting [19].

On assessing the knowledge of different year medical students on universal work precaution, a decreased knowledge of 33.3% was observed among first year medical students with an increase in second year 67.3%, and there after an irregularity was found in the distribution of knowledge between third, fourth and fifth year of study, with highest knowledge response of

95.5% among third year medical students. A steady increase in knowledge among third year students may be the result of instructions provided to the students on UWP which is found to be decreasing in the later years. In a study by Saleem et al. the knowledge, attitude and practice of medical students was assessed and an overall increase in knowledge of medical students was detected with seniority in medical college [15]. Another study by Calabro et al. reported a steady increase in knowledge among students on providing a planned intervention and after two years a decrease in knowledge was identified among the students indicating the need for retaining the knowledge among student population through the introduction of effective training methods [20].

In the present study 60.8% of the participants opined recapping and disposing sharps and syringes after use and a majority of 95.4% had the opinion of disposing sharps in a closed puncture resistant basket. In a study by Motamed et al. only 58% medical students opined on recapping sharps after use and 100% medical students practiced the disposal of used needles into a sharp box after injection [16]. A study conducted by Abiodan et al. reported 92% medical students practicing recapping needles [21] and another study by Hesse et al. found 78% health care workers practicing recapping needles [22]. Recapping of used needles is reported as one way through which health workers sustain needle pricks [23]. In a study conducted by Gurubacharya et al. 74% health care workers were reported having history of needle stick injury [23].

The study conducted by Motamed et al. reported 74.5% medical students and 89.9% health care workers practicing washing with soap and water for 5 minutes as the first step on contact with infectious material [16]. In the present study a majority of 84.4% favored the necessity of washing thoroughly with soap and water and 55.2% opined bleeding by squeezing on injury by needle pricks, cuts or scratches. Study by Hsieh et al. specified that on exposure to infectious material 60.9% of the health care workers washed the wound thoroughly with soap and water and also followed the method of encouraging the wound to bleed till the blood clots [24]. The study by Abiodan et al. revealed a majority of 94.2 % medical students practicing dressing of open cuts of broken skin during clinical work while in the present study only 71.2% participants opined it necessary to provide waterproof dressing on injury [21].

The present study reported 94.3% participants with the opinion on the necessity of wearing surgical aprons 93.9% stated wearing masks necessary during surgery and 82.5% were with

the opinion of wearing protective goggles during surgery while in practice 80.2% wore surgical aprons, 81.6% wore masks and only 63.7% practiced wearing protective goggles during surgery. Thus participants showed a positive attitude towards the implementation of universal precautions but on evaluating practice a decreased practice was detected among the study subjects which is in accordance to the study by Askarian et al. indicating an increased attitude and decreased practice among the student population [19].

Among medical students occupational exposures to blood are common [25]. In the present study a majority 13.7% participants reported incidence of splashes of blood and body fluids and a majority of 92% opined it necessary to be aware of UWP to prevent infections from blood and body fluids. A study done by Laraqui et al. indicated that 58.6% of the respondents underwent at least one occupational blood exposure [26]. In the study by Askarian et al. 75% medical students put forward their opinion on the necessity of more education on universal precaution [27].

In the present study among participants who had knowledge on universal precaution an increase in practice was observed. Thus the present study indicates an increase in practice with increase in knowledge on UWP which in contrast to the study by Rampal et al. indicating gaps between knowledge and practice among health care workers [28]. Another study by Kim et al. specifies a positive correlation between knowledge and practice of universal precaution [29]. Salehi et al. in his study emphasizes the need for developing strategies enhancing the use of universal precautions through behavioural changes, increase of knowledge and by including the integration of knowledge into practice [30].

Conclusion

The present study indicates an increase in attitude and decrease in practice among the study population. The study also signified an increase in practice among the participants with knowledge on UWP thus concluding the need for providing proper education on transmission of blood-borne infections, standard precautions and increasing availability of protection strategies. The study also specifies the requirement for providing knowledge on UWP to the entry year medical students and for providing continuous assistance for the later years thus preparing them for appropriate clinical practices by adopting UWP which would be a future asset for them during professional practice.

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