A Study to Assess the Level of Awareness of Medical Students in Barbados to HIV and AIDS

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Abstract

Background: Healthcare providers have faced potentially lethal infection risks throughout history but HIV/AIDS has motivated doctors and healthcare workers to address occupational health risks. Exposure to blood-borne diseases during clinical training of medical students raises medical, legal, ethical and professional issues. Students and house officers are at greater risk of sustaining blood-borne disease exposure as they are inexperienced in handling equipment used in minor clinical procedures. A higher risk is involved while handling HIV/AIDS patients.

Aim: The aim of the present study was to examine the knowledge, attitude and risk perception of first year medical students in Barbados to HIV/AIDS.

Materials and Methods: A cross-sectional survey was carried out among first year medical students to assess their awareness of the disease and its prevention. In a classroom setting, a questionnaire eliciting information about the etiopathogenesis of the disease, precautions to be taken in handling HIV/AIDS patients, disinfection and post exposure prophylaxis was circulated.

Results: The response analyses showed that majority of students (70.7% - 96.7%) were aware of the etiopathogenesis, mode of transmission and precautions of HIV/AIDS. Few students (4% - 10%) knew how the virus could be deactivated and the types of high-level disinfectant agents used. Most (60.7% - 86.7%) knew the correct methods for collection and transportation of blood samples. None were aware of the exact management and notification of accidental exposure. Willingness to work with HIV/AIDS patients was reduced to 22.7% but increased to 30% if proper training was provided. Few students (10%) were aware of the 'universal precautions". All students were aware of the concept of safe sex.

Conclusion: Our findings highlight the need for a training programme in "universal precautions" for medical students to help minimize the risk and improve knowledge, skill and competency in treating HIV/AIDS patients before they reach their clinical years.

Key words: Medical students, HIV, AIDS, universal precautions, safe sex

Introduction

In the Caribbean, HIV/AIDS, the most dreaded infection of the 21st century, is the leading cause of death in the 19 to 49 year age group. 330,000 out of a mere 24 million inhabitants of this region are living with HIV/AIDS.[1]

Healthcare providers have faced potentially lethal infection risks throughout history but HIV/AIDS has motivated doctors and other healthcare workers to address their occupational health risk with a greater intensity.[2,3]

The HIV retrovirus undergoes rapid mutation making it impossible to prepare an effective vaccine. The mode of transmission is through sexual intercourse and the disease is spread from human to human via blood and body fluids.[4] The best way to minimize the spread of this infection is by educating people.

Young medical students just completing their pre-clinical training are exposed to patients and are expected to perform minor bed side, surgical procedures where they are likely to get exposed to infective clinical waste, blood products or accidental injuries by sharp instruments during these clinical postings. Both they and house officers therefore face a greater risk of acquiring this blood-borne disease. Coupled to this, the rate at which HIV positive cases are increasing is becoming more of a threat to medical students, healthcare workers and the government. Reports have already shown that healthcare providers have a 0.3% risk of acquiring HIV following a contaminated needle stick injury.[5,6] Accidental exposure to blood-borne diseases during clinical training of medical students therefore raises medical, legal, ethical and professional issues for students, faculty and administrators.

A large number of accidental exposures to infected clinical material and procedure can be prevented through knowledgeable handling of sharp instruments and blood products. Therefore, the concept of "universal precautions" was introduced by the World Health Organization (W.H.O.) which is a set of guidelines that aim to protect people working in health care from blood-borne infections.[7]

The aim of the present study was to examine the general awareness of first year medical students in Barbados to HIV/AIDS. In particular, knowledge, attitude and risk perception of the medical students was assessed using a cross-sectional survey.

Material and Methods

Study Design, Setting, Participants and Data Collection

The present study is an anonymous random cross-sectional survey which was done among the first year medical students at the University of the West Indies, Cave Hill Campus, Barbados in 2012. The study aims were explained to the students and verbal consents were obtained from them. They were advised that participation in the survey was anonymous and voluntary. They were also informed that gender and age would be the only personal information required.

A questionnaire containing fifteen items was circulated in a classroom setting. The students were given 45 minutes to complete the questionnaire which included factual questions to identify and assess their awareness about HIV/AIDS. Information was elicited about the etiopathogenesis of the disease, precautions to be taken in handling the patients, disinfection and post exposure prophylaxis. The contents of the questionnaire are listed in Table 1. The correct response for each item, obtained from the general literature and World Health Organization (W.H.O.) guidelines are shown in the shaded boxes in Tables 2 and 3.

Analysis

The data collected from the medical students were compiled and analysed using Statistical Package for Social Sciences (SPSS) version 18.0.

Results

The total number of respondents was 150 within the age group of 18 to 22 years. Majority of the students were females (83%) and 17% were males. he data analyses showed that majority of students were aware of the etiopathogenesis of the disease (Table 2). 96.7% of respondents indicated correctly that the causative agent was a virus. 1.3% of the population believed that a bacteria or fungus were the causative agents of HIV whereas 0.7% indicated that a protozoa was the causative agent. 90% of the students were correct and indicated that the disease symptoms were presented as repeated infections. Diarrhea (4%), convulsions (2%) and vertigo (2.7%) were also listed as symptoms presented. 1.3% did not respond to the item. The majority of respondents (70.7%) rightly believed that the virus attacked white blood cells whereas 14% believed red blood cells were attacked. 4% believed platelets were attacked and 1.3% thought nerve cells were attacked. 10% of students did not respond to the item. Regarding systems involved, 92.7% indicated correctly in their responses that the immune system was the major system affected whereas 4% believed it to be the musculoskeletal system, 2% the vascular system and 1.3% the nervous system. Regarding the transmission of infection, 90% students rightly believed that the infection was commonly transmitted by sexual intercourse. Few students had misconceptions about the mode of disease transmission with 4% thinking that the disease could be spread by sharing utensils, 2.7% by shaking hands with infected persons and 2% by using public toilets. 1.3% did not respond. Item 6 pertained to infected clinical material responsible for transmission of infection. According to 90% respondents, infection spread faster through infected blood transfusion and blood products and this was the correct response. In comparison, few students believed that other bodily excreted material spread the infection faster such as stool indicated by 2.7%, saliva indicated by 2% and sweat indicated by 4% of the student population. Few students (1.3%) did not respond to this item (Table 2).

Data obtained for the responses to the sterilization and disinfection section of the questionnaire is shown in Table 3. In general, a wide variety of responses in this area was observed. 26% students indicated that the virus can be inactivated by boiling instruments and the time required for this was 60 minutes, 26% believed it took 40 minutes, 32% believed it took 10 minutes and only 4%

answered correctly that it took 20 minutes. 12% of individuals failed to respond. It was noted that the chemical agents used as high-level disinfectants to inactivate the virus were glutaraldehyde as answered correctly by 10% of students, chlorine (30.7%), sodium hypochlorite (30.7%) and benzene (8%). 20.6% of students failed to respond.

Results obtained for the collection and transportation of blood samples are shown in Table 3. Respondents had varying concepts regarding the use of gloves while handling body fluids and collecting blood samples from a patient. 86.7% of students were correct and indicated the need for gloves to be used whereas 5.3% felt that gloves were not required. 8% did not respond to this item.

On the item of transporting samples to the laboratory (Table 3), the majority of students (60.7%) were right and indicated that using disposable screw capped bottles in a closed container was the best way of transporting blood samples to the laboratory. 22% thought an ordinary rubber bottle was sufficient, 12% felt bottles with screw caps were adequate whereas 1.3% indicated that using disposable screw capped bottles in an open container was the best method of sample transportation to the laboratory. 4% of students failed to respond.

The data collected for the responses on the section on needle disposal and accidental needle stick injury is shown in Table 3. Regarding disposal of used needles, 52% of students chose the right answer indicating that uncapped needles should be placed in a puncture resistant container as a disposal method. 24.7% respondents suggested that the needle should be destroyed after use. A few students (12%) indicated that the needle should be recapped before disposal, 2% suggested that the needle can be re-used after boiling. 9.3% did not respond.

In the case of accidental exposure to body fluids or injury by needle or sharp instruments, the correct protocol was to wash the exposed area with soap and water and then notify a senior doctor and the higher authorities. 60% of respondents suggested washing the wound with soap and water only, 30.7% indicated getting a blood test for HIV infection only. 9.3% did not respond. None of the respondents were aware about notification to the senior doctor or higher authorities in case of accidental exposure to body fluids or needle stick injury (Table 3).

Regarding the concept of safe sex, 100% of respondents agreed to the use of condoms with a single partner which was the correct response (Table 3). The willingness to treat HIV/AIDS patients was however low (Table 4). Only 22.7% were ready to handle HIV/AIDS patients. If adequate training was provided during pre-clinical years, then willingness increased to 30%. 10% of students agreed that there should be insurance coverage and adequate compensation in case of acquiring infection as an occupational hazard. On the item of universal precautions, only 10% of respondents were aware of this.

Discussion

The present study was conducted to assess the knowledge, attitude and risk perception of medical students in Barbados to HIV and AIDS. An anonymous cross-sectional survey was carried out among first year medical students. The purpose of the study was explained to the

students to minimize any apprehension. The group of respondents ranged between the age group 18 to 22 years. It was established that the major source of their information was gained through the medical curriculum as well as social media and online technology.

Regarding the transmission of infection, a subset of students had misconceptions about the mode of disease transmission thinking that the disease could be spread by sharing utensils, by shaking hands with infected persons or by using public toilets. These results indicate the importance of getting over the misconceptions, myths and stigma that have been reported previously amongst students in various health disciplines.[8-10] A teaching curriculum containing comprehensive information about HIV/AIDS and associated medical, ethical and legal issues will be beneficial in alleviating these negative attitudes and thus assist in improving the health care system.

In the present study, the first year medical students had varying concepts regarding the use of gloves while handling body fluids and collecting blood samples from a patient however, 86.7% of them indicated that gloves should be used while handling body fluids and collecting blood samples from a patient. According to a study conducted by Diekema and group[11], 95-99% students agreed to use gloves while handling blood and body fluids. Overall, their findings are similar to ours in that only 5.3% of our students felt that the use of gloves was not required.

An interesting observation made in the present study was that none of the students were aware about notification to the senior doctor or higher authorities in case of accidental exposure to body fluids or needle stick injury. In another study, 47 students received needle stick injury but only 14 students reported the incident to a senior consultant.[12] According to a study by Norsayani and Noor Hassim[13] the numbers of episodes of needle stick injury decreased with proper use of universal precautions. The group also reported that medical students faced a higher risk of needle stick injury. As the incidence of contracting AIDS is 0.4% in the case of needle stick injury,[14] this highlights the need for adequate training sessions about universal precautions to be put in place before students assume their clinical postings. Appropriate post exposure prophylaxis is an integral part of prevention, control and work place safety. In the present study, none of the students were aware of the necessary post exposure management and prophylaxis. These findings are in agreement with those by Esin and co-workers[15] who reported that knowledge of post exposure prophylaxis against HIV infection was very low. About 62% doctors knew about the post exposure prophylaxis policy in the hospital. The same study indicated that 90% candidates did not know about the seroconversion following a needle stick injury. We recommend that along with adequate training sessions, medical students should be offered free blood tests up to 12 weeks as seroconversion is reported up to 12 weeks after accidental exposure.[16] We also recommend that student counselors be available for students seeking advice. Putting these strategies in place may help to alleviate any anxiety or apprehension experienced by medical students dealing with HIV/AIDS patients.

In the present study, the willingness to treat HIV/AIDS patients was low; however, if adequate training was provided during pre-clinical years, then willingness increased thus indicating the need for a proper training session. Our findings are in alignment with the study by Diekema and group[11] who also reported that willingness to handle HIV positive cases increased after a post training session.

Only a minority of students in our study were aware of universal precautions. Diekema and group[11,17] observed that after a proper training session, knowledge about the universal precautions was much improved. However, Kwee and Ka'anehe[18] stated that knowledge of universal precautions may not correlate with minimized risk of occupational exposure among medical students. Helfgott and group[19] observed that knowledge about the universal precautions was 100% among the resident doctors of Gynaecology and Obstetrics, while overall compliance was only 89%. Based on our findings, we recommend that the teaching curriculum should have adequate coverage regarding universal precautions in order to increase knowledge in this area. Handlers should also be willing to apply these precautions.

Our study has provided information on the general awareness of first year medical students in Barbados to HIV/AIDS and highlights the need for early and relevant training commencing in the pre-clinical years. Further work is needed to elucidate the possible reasons behind the reduced willingness to work with HIV/AIDS patients. The potential findings from that study may help to put in place appropriate strategies and training that focuses on attitudes in working specifically with HIV/AIDS patients to help minimize related stigma and discrimination and to encourage a positive attitude and increase professionalism in the healthcare workforce. In conclusion, the devastating outcome of this global pandemic can be reduced by prevention of HIV/AIDS. This can only be achieved by educating our medical students, health care professionals and the general public.

Conflict of Interest: The authors declare no conflict of interest.

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Table 1: Contents of the Questionnaire

Items	Question Contents
Question(s) 1 - 6	Etiopathogenesis
Question(s) 7 - 8	Methods to de-activate the virus and Disinfecting agents
Question(s) 9 - 10	Collection and transportation of blood samples
Question(s) 11 - 12	Disposal of needles and in case of accidental exposure to infected
Question(s) 13	Concept of safe sex
Question(s) 14	Willingness to work with HIV positive patients
Question(s) 15	Knowledge about universal precautions

Table 2: Etiopathogenesis of HIV. Correct responses are indicated in shaded boxes.

1	**Causative agent**	*Virus*	*Bacteria*	*Fungus*	*Protozoa*	*No response*
	Actual Student numbers / (%)	**145 (96.7%)**	**2 (1.3%)**	**2 (1.3%)**	**1 (0.7%)**	**0 (0%)**
2	**Symptoms**	*Repeated Infection*	*Diarrhea*	*Convulsion*	*Vertigo*	*No response*
	Actual Student numbers / (%)	**135 (90%)**	**6 (4%)**	**3 (2%)**	**4 (2.7%)**	**2 (1.3%)**
3	**Cells**	*White blood cells*	*Red blood cells*	*Platelets*	*Nerve cells*	*No response*
	Actual Student numbers / (%)	**106 (70.7%)**	**21 (14%)**	**6 (4%)**	**2 (1.3%)**	**15 (10%)**
4	**System involved**	*Vascular system*	*Musculoskeletal*	*Immune system*	*Nervous system*	*No response*
	Actual Student numbers / (%)	**3 (2%)**	**6 (4%)**	**139 (92.7%)**	**2 (1.3%)**	**0 (0%)**
5	**Mode of transmission**	*Sexual intercourse*	*Sharing utensils*	*Shaking hands*	*Using public toilets*	*No response*
	Actual Student numbers / (%)	**135 (90%)**	**6 (4%)**	**4 (2.7%)**	**3 (2%)**	**2 (1.3%)**
6	**Infected clinical material responsible for transmission of infection**	*Blood and blood products*	*Stool*	*Saliva*	*Sweat*	*No response*
	Actual Student numbers / (%)	**135 (90%)**	**4 (2.7%)**	**3 (2%)**	**6 (4%)**	**2 (1.3%)**

Table 3: Sterilization and disinfection, blood sample collection and transportation, needle disposal and incase of accidental needle stick injury and concept of safe sex. Correct responses are indicated in shaded boxes.

Sterilization and Disinfection						
7	**Inactivating of virus by boiling**	*10 min*	*20 min*	*40 min*	*60 min*	*No response*
	Actual Student numbers / (%)	**48 (32%)**	**6 (4%)**	**39 (26%)**	**39 (26%)**	**18 (12%)**
8	**Chemicals used as high-level disinfectant**	*Glutaraldehyde*	*Chlorine*	*Sodium hypochlorite*	*Benzene*	*No response*
	Actual Student numbers / (%)	**15 (10%)**	**46 (30.7%)**	**46 (30.7%)**	**12 (8%)**	**31 (20.6%)**
Collection and transportation of blood samples						
9	**Use of gloves during blood sample collection**	*Gloves <u>are</u> required*	*Gloves are not required*	*No response*		
	Actual Student numbers / (%)	**130 (86.7%)**	**8 (5.3%)**	**12 (8%)**		
10	**Transport of samples to the laboratory**	*Ordinary rubber bottle*	*Bottles with screw caps*	*Disposable screw capped bottles in closed container*	*Disposable screw capped bottles in open container*	*No response*
	Actual Student numbers / (%)	**33 (22%)**	**18 (12%)**	**91 (60.7%)**	**2 (1.3%)**	**6 (4%)**
Needle disposal and incase of accidental needle stick injury						
11	**Disposal of used needles**	*Recap needle and discard them with general waste*	*Destroy the needle*	*Discard uncapped needle in puncture resistant container*	*Boil the needle for re-use*	*No response*
	Actual Student numbers / (%)	**18 (12%)**	**37 (24.7%)**	**78 (52%)**	**3 (2%)**	**14 (9.3%)**
12	**In case of accidental exposure to infected material**	*Wash the area exposed with soap and water*	*Report to senior doctor*	*Get blood test done*	*Notify higher authorities*	*No response*
	Actual Student numbers / (%)	**90 (60%)**	**0 (0%)**	**46 (30.7%)**	**0 (0%)**	**14 (9.3%)**
Concept of safe sex						
13	**Safe sex**	*Single partner*	*Multiple partners*	*Use condom*	*Use condom*	*No response*

	Actual Student numbers / (%)	**0 (0%)**	**0 (0%)**	**0 (0%)**	*with single partner* **150 (100%)**	**0 (0%)**

Table 4: Willingness to work with HIV positive patients

14	**Willingness to work with HIV/AIDS patients**	*No*	*Yes*	*Yes as along as proper training is given during pre-clinical*	*Yes as along as doctors are covered under insurance*	*No response/ Do not know*
	Actual Student numbers / (%)	**22 (14.6%)**	**34 (22.7%)**	**45 (30%)**	**15 (10%)**	**34 (22.7%)**
15	**Awareness of 'universal precautions'**	*No*	*Yes*	*N/A*	*N/A*	*No response*
	Actual Student numbers / (%)	**135 (90%)**	**15 (10%)**			**0 (0%)**