Original Article

ประวัติเสี่ยงด้านสุขภาพบุคคล การสัมผัสความเสี่ยงจากการปฏิบัติงานและการปฏิบัติเพื่อการป้องกันการติดเชื้อไวรัสตับอักเสบ บี ในผู้ปฏิบัติการอาสาสมัครกู้ชีพเบื้องต้น

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Personal Health Risk History, Occupational Risk Contact and Preventive Practice Towards Hepatitis B Infection Among Medical First Responders.

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บทคัดย่อ:

การศึกษานี้เป็นการศึกษาภาคตัดขวาง เพื่อประเมินประวัติเสี่ยงด้านสุขภาพบุคคล การสัมผัสความเสี่ยงจากการปฏิบัติงานและการปฏิบัติเพื่อการป้องกันการติดเชื้อไวรัสตับอักเสบ บี ในผู้ปฏิบัติการอาสาสมัครกู้ชีพเบื้องต้นที่ปฏิบัติงานในพื้นที่สาธารณสุขเขต 5 จำนวน 269 ราย ที่สมัครใจเข้าร่วมการศึกษา ทำการเก็บข้อมูลระหว่างเดือนกุมภาพันธ์ ถึง สิงหาคม พ.ศ. 2554 โดยใช้แบบสอบถามเกี่ยวกับข้อมูลสังคมประชากร ประวัติเสี่ยงด้านสุขภาพบุคคล การสัมผัสความเสี่ยงจากการปฏิบัติงานและการปฏิบัติเพื่อการป้องกันการติดเชื้อไวรัสตับอักเสบ

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บี ผลการศึกษา พบว่า ร้อยละ 83.6 ของผู้ปฏิบัติการอาสาสมัครกู้ชีพเบื้องต้นเป็นเพศชาย ร้อยละ 88.8 มีการศึกษาระดับมัธยมศึกษาหรือต่ำกว่า ร้อยละ 29.7 ไม่ได้รับการฝึกอบรมก่อนปฏิบัติงาน ประมาณร้อยละ 62.1 เคยสักและ/หรือเจาะหู จมูก หรือตามร่างกายส่วนอื่น ร้อยละ 7.8 มีประวัติการใช้ยาเสพติดชนิดฉีด และร้อยละ 28.6 มีประวัติมีเพศสัมพันธ์นอกสมรสโดยไม่ใช้ถุงยางอนามัย สำหรับการสัมผัสความเสี่ยงจากการปฏิบัติงาน พบว่า ร้อยละ 65.4 เคยสัมผัสกับเลือดและสารคัดหลั่ง และร้อยละ 42.4 เคยถูกเข็มตำและ/หรือของมีคมบาดขณะปฏิบัติงาน คะแนนการปฏิบัติเพื่อการป้องกันการติดเชื้อไวรัสตับอักเสบ บี มีคะแนนเฉลี่ยค่อนข้างต่ำ เท่ากับ 4.19±2.11 จากคะแนนเต็ม 7 คะแนน ดังนั้นผู้ปฏิบัติการอาสาสมัครกู้ชีพเบื้องต้นควรได้รับการฝึกอบรมเสริมทักษะการป้องกันแบบครอบจักรวาลและทักษะชีวิตเพื่อลดความเสี่ยงต่อการติดเชื้อไวรัสตับอักเสบ บี ขณะปฏิบัติงาน

คำสำคัญ: การติดเชื้อไวรัสตับอักเสบ บี, การปฏิบัติเพื่อการป้องกันโรค, การสัมผัสความเสี่ยงจากการปฏิบัติงาน, ประวัติเสี่ยงด้านสุขภาพบุคคล, ผู้ปฏิบัติการอาสาสมัครกู้ชีพเบื้องต้น

Abstract:

A cross-sectional study of 269 medical first responders (MFRs) in the fifth public health region of Thailand was conducted by voluntary participation between February and August 2011 to assess personal health risk histories, occupational risk contacts, and preventive practices towards hepatitis B virus (HBV) infection. Data from all voluntary MFRs were collected using a structured questionnaire consisting of socio-demographic characteristics, personal health risk histories, occupational risk contacts, and preventive practices towards HBV infection. Results revealed that 83.6% of studied MFRs were male, 88.8% finished only secondary level or lower, and 29.7% did not pass the training before working. Approximately 62.1% used to tattooing and/or piercing a hole in the ears, nose and other parts of the body, 7.8% had a history of injecting drug use, and 28.6% had a history of extramarital sex relations without using condom. For occupational risk contacts, 65.4% had a history of blood and/or secretion contact, and 42.4% had a history of needle stick and/or sharp injury during working. Their preventive practice mean score towards HBV infection showed rather low level with the mean score of 4.19±2.11 from a total score of 7. Therefore, the MFRs should be provided with training in universal precaution practices and life-skill education in order to reduce the risk of HBV infection during working.

Keywords: HBV infection, medical first responders, occupational risk contact, personal health risk history, preventive practices

Introduction

Hepatitis B virus (HBV) infection is a blood-borne infection. The infection is an important global public health problem. The worldwide number of hepatitis B carriers is approximately 350-400 million people or 5% of the world's population.[1,2] The prevalence of chronic HBV infection in many Asian countries was more than 8%.[2,3] Recent studies have shown that Thailand is an intermediate endemic area of HBV infection; the prevalence of HBsAg ranged from 2% to 5% or approximately 2-3 million of Thai population.[4-6] The virus can be transmitted from infected patients to other people percutaneously, or via mucous membrane, or non-intact skin exposure.[1-3,6-8] Approximately 10% of infected persons may develop into the asymptomatic chronic type. Moreover, 6-10% of chronic hepatitis B will progress to cirrhosis of liver and primary hepatocellular carcinoma.[2,9-11]

Medical first responders (MFRs) are one group of emergency medical personnel who encounter unique occupational hazards while delivering emergency care in the pre-hospital setting.[11] Most MFRs are people doing as an extra job by voluntary participation. They receive training for 16 hours which includes airway care and suctioning, patient health assessment, cardio-pulmonary resuscitation (CPR), stabilization of injuries, care for medical and trauma emergencies, and other skills and procedures as permitted by local regulation.[11,12] They may be at risk for percutaneous injuries and blood splashes that carry the blood-borne pathogens, especially HBV during their job responsibility.[13,14] The range of HBV carrier rate among personnel working in emergency medical service varied from 1% to over 10%.[14,15] At present, the number of accidents is increasing and the MFRs have growing burden to help people involved in accidents, especially those occurring in the provinces. As a result of the increasing number of accidents and the characteristics of the job that may entail exposure to blood or secretion from urgent treatment or first aid, the risk among MFRs is likely to be increased. In Thailand, there are limited data or information as occupational risk contact for HBV infection among this target group. This study attempted to assess personal health risk histories, occupational risk contacts, and preventive practices regarding hepatitis B infection among MFRs in the fifth public health region of Thailand which covers 4 provinces near Bangkok. These provinces have many unskilled migrant workers who are at high risk for HBV infection reported from a previous study.[16] Results from the study may be valuable in the creation of a risk reduction plan for upgrading the quality of working life among this group in this region.

Material and Method

Study design and study samples

A cross-sectional study was carried out between February and August 2011 to assess personal health risk behaviors, occupational risk contacts, and preventive practices regarding HBV infection among MFRs in the fifth public health region of Thailand. This public health region covers 4 provinces, namely Samutsakhon, Samutsongkhram, Phetchaburi and Prachuapkhirikhan. Only 269 MFRs including 132 of Samutsongkhram Sawangbenjatum Foundation, 117 of Samutsakhon Foundation, and 20 of Bangnanglee Samutsongkhram

Foundation voluntarily participated and completed their questionnaires in the study (a purposive sampling by voluntary participation). The sample size was calculated by a formula; $n=\frac{Z^2\alpha/2PQN}{Z^2\alpha/2PQ+Nd^2}$, where; p=the proportion of occupational risk contact towards blood-borne infection in emergency medical personnel $\simeq 0.8$[17], Q=1- p=0.2, Z=standard normal score at $\alpha=0.05=1.96$, d= allowable error=0.05, N=number of MFRs in the fifth public health region $\simeq 1800$ personnel; therefore, n=217. The inclusion criteria were MFRs in the fifth public health region who voluntarily participated and signed the consent form, male or female, age≥15 years.

Research tool: a structured questionnaire

The structured questionnaire contained closed-ended questions including socio-demographic characteristics (such as sex, age, educational level, marital status, annual medical check-up, new employee's pre-training, and working experience), personal health risk histories regarding HBV infection (such as history of jaundice, history of receiving blood and/or hemodialysis, history of contact of blood or blood products, history of tattooing and/or piercing a hold in the other body, history of injecting drug use, history of regular alcohol consumption, history of sexually transmitted diseases (STDs) in a previous year, and history of extramarital sex relation without using condom), occupational risk contacts towards HBV infection in the previous month (such as blood and/or secretion contact during working, history of contact with jaundiced patients or/and HIV patients during working and needle stick and sharp injuries during working), and preventive practices regarding HBV infection (such as hand-washing before and after contacting with blood, blood product and body fluid, wearing disposable gloves when contacting with blood and body fluid, and wearing a surgical mask and/or goggles to protect the mucous membranes of the mouth, nose and eyes during working). Preventive practices were scored as 1 =regular practiced and 0=sometimes or never practiced. The content validity of this structured questionnaire was approved by three experts in infectious disease prevention before use.

Ethical approval

This study is a part of the study protocol entitled "Hepatitis B virus seromarkers and occupational risk exposures among medical first responders, public health region 5, Thailand", which was reviewed and approved by the ethics committee of Faculty of Public Health, Mahidol University (Ref. No. MUPH2011-011).

Data analysis

Study data were analyzed using computer software and presented as descriptive statistics, such as percentage, mean and standard deviation.

Results

Socio-demographic characteristics

Of the total of 269 MFRs studied, 83.6% were male and 16.4% female. Most (61.0%) were in the age group of 21-40 years, 53.9% were single, 88.8% had finished only secondary level or lower, and 11.2% had finished bachelor's degree. Fifty

eight point seven percent had undergone an annual medical check-up, and 70.3% had received new employee's pre-training. For working experience and work-load, it was found that 47.2% had less than 10 years of working experience, and 53.2% worked less than 10 days per month.

Personal health risk histories towards HBV infection

Analysis of personal health risk histories towards HBV infection revealed 3.7% to have a history of jaundice, 5.6% had received blood and/or hemodialysis, 62.1% used to tattooing and/or piercing of the ears, nose or other parts of the body, 7.8% had a history of injecting drug use, 15.6 % had a history of regular alcohol consumption, 4.5% had a history of STDs in the previous year, and 28.6% had a history of extramarital sex relations without using condom. Details are shown in Table 1.

Occupational risk contacts and preventive practices regarding HBV infection

For occupational risk contacts towards HBV infection in the previous month, it was found that 65.4% had a history of blood and secretion contact during working, 1.1% had a history of contact with jaundiced patients and/or HIV patients during working, and 42.4% had a history of needle stick or/and sharp injury during working. Details are shown in Table 2. Data as preventive practices against HBV infection showed that 83.3% regularly wore disposable gloves before contacting or dressing wounds, and 78.1% regularly wore disposable gloves while contacting blood and body fluid. However, only 19.7% regularly wore a surgical mask and goggles to protect the mucous membranes of the mouth, nose and eyes from blood and secretion scattering during working hours. The mean of preventive practices was 4.19±2.11 scores (total score=7). Details are shown in Table 3.

Table 1 Personal health risk histories towards HBV infection among studied MFRs (n=269)

Personal health risk histories	Number (n=269)	Percentage (100.0)
History of jaundice		
Yes	10	3.7
No	259	96.3
History of receiving blood and/or hemodialysis		
Yes	15	5.6
No	254	94.4
History of tattooing and/or piercing a hole in the ears, nose or other parts of the body		
Yes	167	62.1
No	102	37.9

Table 1 (Continued)

Personal health risk histories	Number (n=269)	Percentage (100.0)
History of injecting drug use		
Yes	21	7.8
No	248	92.2
History of regular alcohol consumption*		
Regular	42	15.6
Sometimes	193	71.8
Not answered	34	12.6
History of STDs in the previous year		
Yes	12	4.5
No	250	92.9
Not answered	7	2.6
History of extramarital sex relations without using condom		
Yes	77	28.6
No	149	55.4
Not answered	43	16.0

*Regular=drinking ≥ 5 days/week Sometimes=drinking 1-4 days/week

Table 2 Occupational risk contacts towards HBV infection during working

Occupational risk contact	Number (n=269)	Percentage (100.0)
Blood and secretion exposure		
Yes	176	65.4
No	93	34.6
History of contact with jaundiced and/or HIV patients		
Yes	3	1.1
No	177	65.8
Do not know	89	33.1
Needle stick or/and sharp injury		
Yes	114	42.4
No	155	57.6

Table 3 Preventive practices towards HBV infection among studied MFRs (n=269)

Preventive practices	Regular practices Number (Percentage)
1. Hand-washing before and after removing gloves or having direct contact with patients.	151 (56.1)
2. Hand-washing before and after contact with blood, blood product and body fluid.	176 (65.4)
3. Wearing disposable gloves when having contact with blood and body fluid.	210 (78.1)
4. Wearing disposable gloves before having contact with wound or dressing the wound.	224 (83.3)
5. Wearing a surgical mask and/or goggles to protect mucous membranes of the mouth, nose and eyes during working.	53 (19.7)
6. Blood contaminated gauze, wool and cloth are thrown in the infectious waste container.	157 (58.4)
7. Cleaning the blood-contaminated equipment with 70% alcohol after use.	156 (58.0)
Mean±S.D. of preventive practice scores (Total score = 7)	4.19 ± 2.11 (Min=0, Max=7)

Discussion

This study of 269 MFRs who worked in several foundations of the fifth public health region showed that 83% were male, and 53.9% were single. Approximately 90% had finished secondary education or lower. The findings correspond with previous studies in this group.[15,18] Surprisingly, about 30% of studied MFRs did not pass the training before working. Generally, MFRs or other groups of personnel who work in emergency medical services have to pass at least 16-hour training including airway care and suctioning, patient health assessment, cardio-pulmonary resuscitation (CPR), stabilization of injuries, care for medical and trauma emergencies, and other skills and procedures as permitted by local regulation.[11,12] This weak point should be reconsidered and strengthened. Additionally, the topic of universal precaution or standard precaution, which is an important topic for MFRs to be aware to promote work safety and to reduce risk of blood-borne infections, should be included in the training.

For personal health risk histories, it was found that 62.1% of studied MFRs had tattoos and/or a hole pierced in the ears, nose or other parts of the body. About 8% had a history of injecting drug use, and 28.6% had a history of extramarital sex relation without condom use. These risk histories were reported as a higher percentage than as previous studies in other groups of Thai males; for example; only 14.9-21.3% had tattoos, 2.2-2.3% had a history of injecting drug use, and 8.1-16.4% had a history of extramarital sex relation without condom use.[19,20] These factors are known to be important risk factors for HBV, hepatitis C virus (HCV) and human immuno-deficiency virus (HIV) infections.[7,21-23] Additionally, 15.6% of studied MFRs had a history of regular alcohol consumption, which is compatible with previous studies in Thai males.[19,20] Alcohol drinking is an

indirect risk factor for HBV infection, because, after consumption, the subject is more prone to have extramarital sex relation without using a condom.[24]

Data on occupational risk contacts and preventive practices during working showed that 65.4% of studied MFRs had a history of contact with patient's blood and body fluid, and 42.4% had a history of needle stick and/or sharp injury. Previous studies in health care workers (HCWs) showed that 40% to 76.6% of accidents from work were percutaneous exposure incidents (needle stick and/or sharp injury).[25-27] In addition, 5.5% of personnel working in emergency medical service (EMS) had a history of needle stick and 3.1% had a history of mucous membrane exposure. These probably resulted from a number of factors including working environment, equipment readiness, working experience and universal precaution practices.[26] Preventive practices against HBV infection or universal precautions aim to prevent transmission of HBV, HIV, and other blood-borne pathogens. The principal is to assume patients are infected with blood-borne pathogens, and ensure that health staff can minimize the risk of exposure to infected body fluids.[26,28] The present study revealed that 65% of studied MFRs usually practised hand-washing before and after contact with patient's blood and secretion, and only 19.7% usually practised wearing a surgical mask and goggles to protect the mucous membranes of the mouth, nose and eyes during working. Compliance with these universal precautions has been shown to reduce the risk of exposure to blood and body fluids.[28] Implementing a training package may help because universal precautions provide protection from a range of blood-borne pathogens, but their effectiveness relies upon the knowledge of the health care workers and the level of compliance in their use.[28] However, this study provides only preliminary findings due to the limitations of the study, such as, selection bias (purposive selection by voluntary participation) and bias from recall memory.

Conclusion

Studied MFRs had some personal health risk histories, occupational risk contacts, and a low level of preventive practices regarding HBV infection. The MFRs should be provided with, and encouraged to undergo, training in universal precaution practices in order to reduce the risk of blood-borne infections, especially HBV infection, during working, as well as, the 16-hour training program for EMS response. Additionally, life-skill education should be provided for this group to reduce their personal health risk behaviors.

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