Hepatitis needs assessment among Jordanian healthcare workers

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Background: Hepatitis infections caused by hepatitis A, B and C virus are considered to be an important health problem worldwide. Based on the available data from the Jordanian Ministry of Health, the incidence rates of hepatitis A and B in the Jordanian population in 2003 were 10.2 and 0.8 per 100 000 per year, respectively; however, data on the incidence of hepatitis C are not currently available.

Research objective: To assess Jordanian healthcare workers’ hepatitis training needs.

Methods: A total of 339 healthcare workers from private and public Jordanian healthcare settings participated in this descriptive study. The Minnesota Primary Care Practitioners Viral Hepatitis Survey was utilized for data collection.

Results: Two-thirds of the participants expressed that they did not have adequate and current training in issues related to hepatitis infections. Healthcare workers indicated an interest in receiving information and training about hepatitis A, B and C (83%, 71% and 80%, respectively).

Conclusion: The results of this study showed that the majority of Jordanian healthcare workers reported a need for hepatitis training.

Implication to practice: Standardized training should be provided to healthcare workers who are working in high-risk settings.

Keywords: Assessment, Healthcare Workers, Hepatitis, Jordan, Standard Precaution, Training Needs

Background
Hepatitis is defined as an inflammation of the liver caused by viral infection, which can lead to chronic diseases, or can be life-threatening [Centers for Disease Control & Prevention (CDC) 1991]. Hepatitis is considered the major cause of liver disease and liver cancer. Worldwide, liver cancer is the third most common cause of cancer mortality, with approximately 550 000 deaths annually. The American Cancer Society estimated 14 270 deaths from liver cancer in the USA in 2004, of which 70% to 80% were hepatocellular carcinoma (HCC) (Parkin et al. 2001).

At present, there are an estimated 2.7 million Americans chronically infected with hepatitis C virus (HCV) (Alter et al. 1999), and 1.3 million chronically infected with hepatitis B virus (HBV) (Lok & McMahon 2004). These individuals are at high risk for the occurrence of HCC, a disease for which long-term survival rates are poor. Chronic infection with HCV and/or HBV is associated with the majority of HCC cases. Recent estimates for the USA have attributed 47% of cases HCC to HCV alone, 15% to HBV and 5% to coinfection with both viruses (Di Bisceglie et al. 2003).
The carrier rates of HBV in Middle Eastern countries, which are considered developing countries, range from 2% to 7% (Margolis et al. 1991). The overall prevalence of hepatitis A virus (HAV) is 52.4% among children in Saudi Arabia (Al-Faleh et al. 1991). In Jordan, the prevalence of HBV ranges from 2.6% to 10% (Toukan et al. 1990). Based on the available data from the Jordanian Ministry of Health in 2003, the incidence rates of hepatitis A and B were 10.2 and 0.8 per 100 000 per year, respectively (Jordanian Ministry of Health in 2003, the incidence rates of hepatitis A (Toukan et al. 1990). Based on the available data from the Jordanian Ministry of Health in 2003, the incidence rates of hepatitis A and B were 10.2 and 0.8 per 100 000 per year, respectively (Jordanian Ministry of Health 2003). On the other hand, sufficient information about the incidence of hepatitis C is not available.

Healthcare workers and hepatitis

Hepatitis B virus was one of the first blood-borne pathogens to be recognized as an occupational risk among healthcare workers (HCWs) (Trumbull & Greiner 1951). The risk of developing clinical/serological evidence of HBV infections among unvaccinated HCWs was between 23% and 37% (Werner & Grady 1982). The risk of acquiring HBV from a needle stick was 100 times that of acquiring human immunodeficiency virus (HIV) [World Health Organization (WHO) 2000b].

Globally, an estimated 170 million individuals are chronically infected with HCV, and three to four million people are newly infected each year (WHO 2000a). HCV is spread primarily by direct contact with human blood. The major causes of HCV infection worldwide are the use of untested blood transfusions and re-use of needles and syringes that have not been adequately sterilized (WHO 2000b).

Over 20 types of blood-borne pathogens such as HIV, hepatitis B and C have been transmitted to HCWs via sharps injuries (Varghese et al. 2003). A study conducted by Beltrami et al. (2000) showed that the risk for transmission of HBV was 6% to 30% and the risk of HCV transmission is approximately 1.8%. The study recommended that, to minimize the risk of blood-borne pathogen transmission from HCWs to patients, all HCWs should adhere to standard precautions, including the appropriate use of hand-washing, protective barriers, and care in the use and disposal of needles and other sharp instruments. The number of HBV, HCV and HIV infections linked to unsafe practices in developing countries has been calculated as 8–16 million HBV, 2.3–4.7 million HCV and 80 000–160 000 HIV infections every year. In addition, at least 20% of all new HBV infections in developing countries are attributed to unsafe injections (Kane et al. 1999).

Standard precautions for hepatitis

Standard precautions are a set of protocols designed to prevent or reduce the risk of transmission of pathogens. Under standard precautions, blood, all body fluids and all body substances of patients are considered potentially infectious (CDC 1997). The core elements of standard precautions comprise (1) hand-washing after patient contact, (2) the use of barrier precautions (e.g. gloves, gowns and facial protection) to prevent mucocutaneous contact, and (3) minimal manual manipulation of sharp instruments and devices, and disposal of these items in puncture-resistant containers (CDC 1987).

Standard precautions are frequently not followed in Africa and much of Asia because of both a shortage of supplies and inadequate training. Furthermore, dangerous diagnostic equipment, such as non-retracting finger-stick lancets and glass capillary tubes, are often used in developing countries (Sagoe-Moses et al. 2001). In contrast, in the USA, by law, an effective sharps injury and bloodborne pathogen exposure protocol must be available as a written protocol, communicated to all HCWs in all settings, and uniformly supported and enforced by those in leadership positions (CDC 2004).

Healthcare workers’ training

Education of HCWs about needle stick prevention, along with effective communication and convenient placement of sharps containers, was shown to decrease needle stick injuries by 60% among HCWs at a teaching hospital in California (Haiduven et al. 1995). In addition, a study of HCWs’ blood exposures, using self-reported questionnaires before and after standard precaution training, showed a decrease in the mean number of blood exposures per year from 35.8 to 18.1 among clinical HCWs (Fahey et al. 1991).

Significance

To date, there is no published information about applying standard precautions in Jordanian care settings or the training needs of Jordanian HCWs about hepatitis. This is the first study that assesses the availability of protocols that contain standard precautions in Jordanian care settings. In addition, this study filled a gap in identifying training programme needs of Jordanian HCWs who provide services to people with or at high risk for viral hepatitis.

The study questions are the following:

1. Do Jordanian healthcare settings have a protocol that contains standard precautions for hepatitis?
2. What are the hepatitis training needs of Jordanian HCWs?

Methods

This descriptive cross-sectional study was conducted in 20 private and 10 public hospitals in Jordan. These hospitals were selected because they had the following units: (1) coronary care units, (2) intensive care units, (3) surgical intensive care units, (4) intermediate care units, (5) cerebral vascular accident care units, and (6) neonatal intensive care units. The total number of
hospitals in Jordan in 2006 was 98 hospitals, with a total bed capacity of 10,141 beds.

Data collection procedures
Thirty hospitals were randomly selected out of 98 hospitals, then HCWs from these 30 hospitals were invited to participate in this study. Permission to conduct the study was obtained from the Institutional Review Board at the researchers’ university, the Jordanian Ministry of Health and the hospital directors. This investigation was carried out between July and October 2005 using the Minnesota Primary Care Practitioners Survey Viral Hepatitis Instrument (MPCPSVHI).

Four research assistants were hired and trained for data collection. The researchers invited all HCWs from the selected hospitals who provided direct patient care and worked at least 1 day per week to participate in the study. The researchers obtained a list of physicians and nurses who worked at selected hospitals from the Jordanian Ministry of Health. Each hospital was given a special code to help in identifying HCWs who worked at that area. The study sample was computed using PASS 2002 Power Analysis and Sample Size Software. A sample size of 600 participants was needed to conduct data analyses with a power equal to 0.80 at alpha equal to 0.05 (Polit & Hungler 1999).

Anonymous questionnaires were given in person to 600 HCWs. All HCWs were allowed up to 4 h to complete the survey; then the researcher who gave the questionnaire to the participant collected the questionnaire. To lessen identity concerns, the investigator informed the participants that all personal information that was gathered in this study would be kept confidential and no individual’s performance could be identified.

The instrument
The Minnesota Primary Care Practitioners Survey Viral Hepatitis Instrument was utilized in this study to evaluate hepatitis risk assessment and perceived training needs. In 2002, the Minnesota Department of Health conducted an assessment of hepatitis prevention activities in Minnesota State using this survey, which highlighted the need for more information about the hepatitis prevention and control practices of primary care providers. To expand using this survey in other cultures, permission was obtained from the authors for the MPCPSVHI to be used in Jordan.

The MPCPSVHI includes 37 questions about demographic characteristics, screening and risk assessment practices for hepatitis (A, B and C), using universal guidelines for hepatitis prevention and control, hepatitis reporting procedures, scope of hepatitis C practice and expertise, partner services, and training needs for hepatitis. The format of this instrument is dichotomous ‘yes’ or ‘no’ answers. The survey was given in the English language, because all HCWs who participated in the study were familiar with this language.

A pilot study was conducted to assess the validity and reliability of the MPCPSVHI for the Jordanian HCWs, and appropriate modifications were made. Fifty Jordanian HCWs were invited to participate in the pilot study. Anonymity and confidentiality of participants’ information were assured. All questionnaires were numerically coded before being sent to subjects. Only the researchers handled the questionnaires and data were destroyed after completing the study. The only modification was to a question that discussed if ‘HCWs think that they have an adequate and current training in issues concerning all types of hepatitis’. The modification involved changing the answers to per cents (i.e. 0%, 20%, 40%, 60%, 80% and 100%) instead of ‘yes’ or ‘no’ answers.

Data analyses
Descriptive statistics (i.e. means, standard deviations, percentages and frequencies) using the Statistical Package for the Social Sciences for Windows, version 11.5 were used to answer the research questions. Six hundred questionnaires were distributed: 400 questionnaires to the private sector and 200 questionnaires to the public sector. A total of 225 out of 400 questionnaires were completed by HCWs who worked in the private sector (response rate 56.25%). Among HCWs working in the public sector, 114 out of 200 were completed (response rate 57%). The overall survey response rate was 339 from 600 subjects (56.5%).

Results
The sample included 76.7% (n = 260) nurses and 18.6% (n = 63) physicians; 4.7% (n = 16) participants did not identify their profession. Two-thirds [n = 225, (66.37%)] of respondents worked in the private sector compared with one-third [n = 114, (33.63%)] in the public sector. A bachelor’s degree was the highest educational level for 87% (n = 295) of HCWs who participated in the study, while 13% (n = 44) held a master’s degree. With regard to age, more than two-thirds [n = 228, (67.33%)] of HCWs were less than 30 years old.

The majority of Jordanian HCWs reported that they did not have protocols available that contain standard precautions for all types of viral hepatitis (Table 1). Approximately two-thirds of HCWs [n = 233, (68.73%)] reported that they did not have standard protocols for hepatitis A; half of HCWs [n = 178, (52.52%)] reported that they did not have standard protocols for hepatitis B; and two-thirds [n = 247, (72.93%)] of HCWs reported that they did not have standard protocols for hepatitis C.

More than two-thirds of the respondents said that they did not have adequate training in issues related to hepatitis infections. For example, when HCWs were asked if they were interested in
Table 1 Availability of standard protocol for hepatitis in Jordanian healthcare settings (n = 339)

<table>
<thead>
<tr>
<th>Healthcare workers responses</th>
<th>Standard protocol for hepatitis A n (%)</th>
<th>Standard protocol for hepatitis B n (%)</th>
<th>Standard protocol for hepatitis C n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21 (6.2)</td>
<td>105 (30.1)</td>
<td>60 (17.7)</td>
</tr>
<tr>
<td>No</td>
<td>233 (68.7)</td>
<td>178 (52.5)</td>
<td>247 (72.9)</td>
</tr>
<tr>
<td>Unsure</td>
<td>69 (20.4)</td>
<td>56 (16.5)</td>
<td>32 (9.4)</td>
</tr>
<tr>
<td>Missing</td>
<td>16 (4.7)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>339 (100)</td>
<td>339 (99.1)*</td>
<td>339 (100)</td>
</tr>
</tbody>
</table>

*The percentages may not add up to 100% because of rounding of values.

Table 2 Healthcare workers training needs (n = 339)

<table>
<thead>
<tr>
<th>Healthcare workers responses</th>
<th>Hepatitis A n (%)</th>
<th>Hepatitis B n (%)</th>
<th>Hepatitis C n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>280 (82.6)</td>
<td>239 (70.5)</td>
<td>271 (79.9)</td>
</tr>
<tr>
<td>No</td>
<td>58 (17.1)</td>
<td>100 (29.5)</td>
<td>66 (19.5)</td>
</tr>
<tr>
<td>Unsure</td>
<td>1 (0.29)</td>
<td>0 (0)</td>
<td>2 (0.68)*</td>
</tr>
<tr>
<td>Total</td>
<td>339 (99.9*)</td>
<td>339 (100)</td>
<td>339 (99.98)*</td>
</tr>
</tbody>
</table>

*The percentages may not add up to 100% because of rounding of values.

receiving viral hepatitis information and training about hepatitis A \[n = 280, (82.6\%)] answered yes. Approximately 71\% \((n = 239)\) of HCWs indicated an interest in receiving information and training about hepatitis B; and 79.9\% \((n = 271)\) of HCWs indicated a need for training and information about hepatitis C (Table 2).

Two-thirds \((n = 239)\) of respondents were interested in receiving information and training about hepatitis in the following areas: (1) hepatitis diagnosis, (2) hepatitis risk assessment, (3) sexual history taking, (4) hepatitis vaccine, (5) hepatitis treatment, and (6) hepatitis counselling. It is very interesting that the number showing interest in each topic was the same. On the other hand, type of profession did not affect the willingness to receive information and training about hepatitis. For example, two-thirds \((70.5\%)\) of nurses and physicians who participated in this study answered positively regarding receiving information and training about hepatitis.

Discussion

Healthcare workers such as nurses, clinical laboratory workers and physicians are at high risk of being infected with hepatitis (CDC 1989). The nature of their work demands performance of multiple invasive diagnostic and therapeutic measures. Injuries from instruments handled by HCWs involve exposure to blood and body fluids. To protect both HCWs and patients from infection with bloodborne pathogens in the healthcare setting, the concept of universal precautions was developed in the mid-1980s as a result of the HIV epidemic (CDC 1987).

According to the CDC, over 80\% of sharps injuries can be prevented with application of standard precautions and use of safer needle devices (CDC 1997). This, in conjunction with HCWs’ work practice controls and education, can reduce injuries by over 90\% (Jagger 1996). On the other hand, there is significant evidence suggesting that not adhering to standard precautions results in exposure to bloodborne pathogens such as hepatitis from patients to HCWs, from patients to patients, and from HCWs to patients (De Carli et al. 1994).

The CDC estimated that 12 000 HBV infections affected HCWs in the USA in 1985 (CDC 1989). Since then, the number has declined steadily, down to an estimated 500 in 1997 (Mahoney et al. 1997). The decline in occupational HBV by more than 95\% is due largely to the widespread application of standard precautions and immunization of HCWs (Fahey et al. 1991). In Jordan, where this study took place, no national policies are available regarding immunization for hepatitis A and B, and it is optional for the public and HCWs to be vaccinated against hepatitis B. This puts Jordanian HCWs who are unfamiliar with standard precautions at risk for hepatitis and other bloodborne pathogens. HCWs in other Middle Eastern and developing countries may also be at risk of occupational exposures for similar reasons.

Furthermore, the results of this study revealed that the majority of Jordanian HCWs were not familiar with whether or not their institutions have written protocols that contain standard precautions regarding hepatitis. This may mean that many Jordanian HCWs are at high risk for exposure to hepatitis. Lack of knowledge about standard precautions, and the importance of applying standard precautions, could explain why HCWs in developing countries are at serious risk of infection from bloodborne pathogens (Kane et al. 1999).

Poor adherence to standard precautions can be due to HCWs’ lack of knowledge about standard precaution. HCWs in developing countries have been found not to ask about protocols that contain standard precautions; however, some researchers have reported that even when HCWs in developing countries were familiar with standard precautions, their adherence to them was poor (Chogle et al. 2002).

Training programmes that provide information on protecting HCWs from exposure to bloodborne pathogens are mandated by law in the USA (United States Department of Labor – Occupational Safety & Health Administration 2001). According to federal regulations (1991) on prevention of spread of bloodborne pathogens (e.g. hepatitis), every employer in a healthcare
setting is required to have a written exposure plan designed to eliminate or minimize exposure to bloodborne pathogens. The document must include all job classifications and job tasks that place HCWs at risk or could lead to occupational exposure to bloodborne pathogens. Employees must be trained to practice safely in their specific areas. All HCWs must be educated in the principles of preventing injuries from needles and other sharp instruments [(e.g., minimizing the use of needles and not recapping needles or manipulating them by hand (Osterman 1995)].

In this study, around two-thirds of Jordanian HCWs felt that they needed training in issues related to hepatitis infections, which reflected a significant training need. Training programmes should include general information about infection prevention and control focusing on the importance of hand-washing; information about HAV, HBV and HCV transmission; assessing risk of exposure; preventing exposures; immunization (HBV vaccine); hepatitis counselling, specific policies and procedures for individual work areas, including protocols after exposure to HBV and HCV; and resources for further assistance (Magura et al. 1994).

Healthcare workers should be educated, through hepatitis prevention training, about the following:

1. that all patients must be treated as potential carriers of bloodborne pathogens,
2. the importance of using appropriate personal protective equipment, such as gloves, mask, gown, and eye protection, during procedures where contamination of blood or body fluids are likely, and
3. careful handling of sharps and avoiding sharp injury, and proper disposal of sharps and infectious waste (Varghese et al. 2003).

Furthermore, all HCWs must receive adequate training about hepatitis before beginning their work and on an ongoing basis. Training programmes should be based on practical situations that HCWs face while performing risky procedures as part of their daily tasks (Epstein et al. 1995).

Healthcare workers play a crucial role in the prevention of transmission of hepatitis and will benefit from becoming informed about screening and risk factors. If more people who are at risk for infection are referred for testing, start treatment and receive counselling about how to prevent spreading the disease to others, there will be hope for the future to end this silent hepatitis epidemic.

In summary, daily bedside patient care presents challenges to HCWs; therefore measures must be taken at the institutional level to minimize HCW risk to contract bloodborne diseases. Prevention is a cost-effective strategy. These measures must be available for HCWs at all times and must be included in the orientation of new employees. This study revealed that most Jordanian HCWs have inadequate knowledge and training in hepatitis (A, B and C). Most of them are also unclear regarding the availability of vaccines for hepatitis and are uncertain regarding treatment regimens for hepatitis infections. Most of the Jordanian HCWs feel that there is inadequate dissemination of hepatitis information. This in turn calls for intensive training programmes for Jordanian HCWs. The Jordanian Ministry of Health plays a significant role in establishing protocols, training HCWs and providing technical assistance regarding how to implement these protocols. HCWs need to know how to apply preventive techniques in routine practice and in unusual situations.

Implications for practice
Managers in Jordanian healthcare settings are urged to establish a system that includes written protocols for HCWs who are at high risk for acquiring hepatitis. Enhanced training and surveillance should be provided to personnel engaged in high-risk activities. Training programmes should be evaluated regularly to ensure that information is current and meets the changing needs of the worker and workplace. Healthcare institutions must establish periodic training programmes for all HCWs who have direct contact with blood or body fluids.

Low cost and short duration training programmes must be conducted for HCWs, including physicians and nurses. Training programmes should include topics about hepatitis, such as risk assessment, vaccination, prevention education, counselling, testing, treatment options, partner notification and follow-up of occupational exposures that might place HCWs at risk of hepatitis.

The findings of this study may also have implications for other Middle Eastern and developing countries. A substantial percentage of respondents in this survey indicated a lack of access to protocols on standard precautions in their workplace and a desire for training on the viral hepatitis agents. As a result, there is a need for similar surveys as a first step towards reducing occupational risks to HCWs from bloodborne pathogens such as HBV and HCV.

Limitations
Data derived from self-reports of high-risk behaviours and diseases may underestimate the occurrence of these high-risk behaviours. Using a convenience sample was a major limitation of this study. Thus, a larger and random sample is warranted in future studies.

References


