

# Risk of Blood-borne Infection Among Health Care Workers in Two Kuala Lumpur Hospitals

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## SUMMARY

Health care workers (HCW) are at high risk of acquiring blood-borne diseases. This study compared the risk of infection among HCW in different hospital units and also between HCW and students in medical fields. This cross-sectional study involved pre-tested questionnaires that were completed by 625 HCW and undergraduate students undergoing clinical attachments from February to August 2001. The respondents were separated into two groups: i) HCW from Hospital Kuala Lumpur, HKL (n=241) and Hospital Universiti Kebangsaan Malaysia, HUKM (n=153) ii) Medical students from Universiti Kebangsaan Malaysia, UKM (n=171) and HUKM student nurses (n= 60). The results obtained showed that the risk of transmission of blood-borne infections varied significantly according to professional ranks ( $p<0.05$ ) and to hospital units ( $p<0.05$ ). The medical intensive care (ICU), haemodialysis, and nephrology and urology units had the highest scores for the risk of infection while the diagnostic laboratory had the lowest risk of infection ( $p<0.05$ ). Preventive measures taken by the subjects in this study were not satisfactory especially with reference to the use of personal protective equipment and the practice of universal precautions.

## KEY WORDS:

*Health care workers, Infection, Prevention, Occupational exposure*

## INTRODUCTION

Health Care Workers (HCW) are more exposed to blood-borne infections than the general population, with subsequent risks of contracting diseases, disability and even death. This is due to their higher exposure rates or contact with blood and body fluids, thus making them a high risk group for transmission of blood-borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV) and human Immunodeficiency virus (HIV). However, this risk of blood-borne diseases is often underestimated by HCW, although previous serologic studies conducted in The United States, HCW had a prevalence of blood-borne infection ten times higher than the general population<sup>1</sup>. HIV seroconversion cases with occupational HIV exposure among HCW have also been documented<sup>1</sup>.

The current study was conducted to assess the risks faced by HCW and also the awareness and preventive measures taken by them concerning hepatitis B and other blood-borne diseases. The specific objectives were to compare the risks of blood-borne infections among HCW in Hospital Kuala

Lumpur (HKL), Hospital Universiti Kebangsaan Malaysia (HUKM) and UKM students and also among HCW in different units and to assess the safety measures and precautions taken to prevent blood-borne infections.

## MATERIALS AND METHODS

This cross-sectional survey was conducted among health care workers and undergraduate medical students in Kuala Lumpur from February 2001 to August 2001. The questionnaire was divided into 5 sections; a) personal biodata b) vaccination status c) medical history d) risk of occupational disease transmission and e) preventive measures taken by the health care workers.

Analysis of the data was performed using the SPSS program version 10.01. Descriptive statistics were used to compare the parameters in this study. Chi Square analysis was conducted to determine if there was a significant difference between the parameters studied. There was a significant difference or association if the p value was below 0.05.

Analysis of variance (ANOVA) was conducted to determine if there was a significant difference of the risk of blood-borne infection among the population studied and also among the units in a hospital. In order to do so, scores for the risk of infection were given for each subject according to the answers given in reply to the questionnaire. The minimum score was 0 and the maximum score was 12. ANOVA was also conducted to determine if there was a significant difference among the groups studied. From the ANOVA analysis, there was a significant difference between the groups compared if 'p' value were less than 0.05.

## RESULTS

The 625 subjects included in this study were divided into two groups: i) HCWs from HKL (n=241) and HUKM (n=153) ii) Students from UKM (n=171) and student nurses from HUKM (n=60). Details of the demographic data and the hepatitis B immunization status have been reported earlier<sup>2</sup>.

### *Risk of Infection*

The analysis of variance (by ANOVA) showed that there was a significant difference in the risk of blood-borne infection between the two groups of subjects ( $p< 0.05$ ) and among hospital units ( $p<0.05$ ). Risk of infection was highest among HCWs in HKL (with mean score of 9.63) and lowest among

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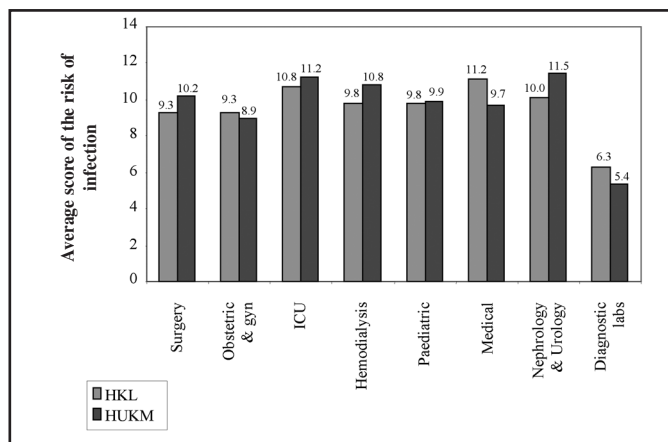


Fig. 1: Comparison of average scores of the risks of infection among the units in HKL and HUKM ( $p < 0.05$ ).

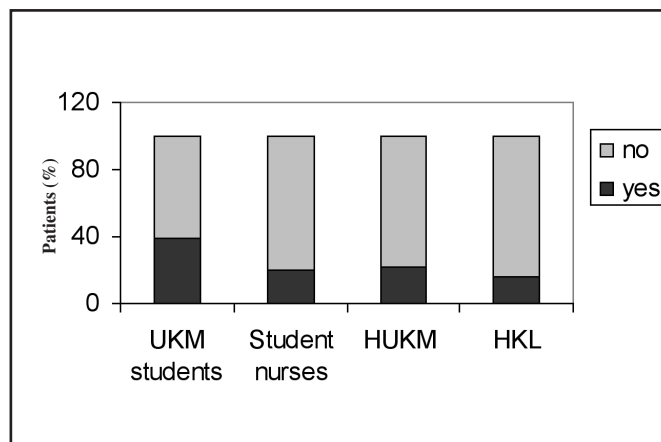


Fig. 2: Adherence to the Universal Precautions ( $p < 0.05$ ).

UKM students (a score of 5.6). The medical unit had the highest risk of blood-borne infection in HKL while the nephrology and urology unit had the highest risk of blood-borne infection in HUKM. Diagnostic laboratories had the lowest risk of blood-borne infection in both HKL and HUKM (Fig. 1).

*Preventive measures*

The practice of washing hands by the subjects was good (an average score of 4.6 out of the maximum score of 5). Student nurses had the highest score (4.8). The scores were quite low for the use of personal protective equipment (1.8 out of 5) and waste disposal (2.1 out of 4). The lowest scores for both prevention methods were 1.3 and 1.8, respectively, among student nurses. The average score for needle prick injury prevention was good (2.7 out of 3) and was highest among HCW in HKL (2.8). Only 24.1% of all test subjects practiced the universal precautions correctly and this was highest among UKM students (39.2%), whereas 84.2% of the HCW in HKL, 80% of student nurses, and 77% of HCW in HUKM, did not practice these precautions at work (Figure II).

**DISCUSSION**

HCW from HKL and HUKM had a significantly higher risk for acquiring infection ( $p < 0.05$ ) than student nurses and UKM students. Also exposure to hepatitis or HIV patients, exposure to blood or body fluids, frequency of sharps management, frequency of blood spilling and intravenous drug administration was higher among HKL and HUKM HCW. Similarly, nurses were found to be more likely to have occupational exposure to blood than students, because they perform more risky or emergency procedures<sup>3</sup>. There was also a significant difference in the risk of infection among HCW from different hospital units. This may be attributable to job tasks, types of services provided in different units and the number of accident-prone procedures performed<sup>4</sup>.

This survey showed that compliance with universal precautions was not satisfactory. Most HCW only took precautions for certain patients with known or suspected

blood-borne diseases at the time when all patients are to be managed in a uniform manner to avoid potential risk of transmission of blood-borne diseases. Medical history and examination cannot reliably identify all patients infected with HIV, HBV and HCV, as any infections may not be clinically apparent<sup>5</sup>. This low compliance with universal precautions could be explained by the lack of sufficient training provided to HCW. Universal precautions enforcement, availability of devices for universal precautions, and programs to increase acceptance and compliance to these precautions are important factors to reduce the risk of transmission of blood-borne diseases among HCW<sup>6,7</sup>.

In conclusion, it was found that most HCW in this study did not take effective precautions to reduce the risk of transmission of blood-borne diseases with low compliance to the universal precautions. Hospitals and more generally, health authorities, are required to enforce the universal precautions practice and provide regular training and education for all staff.

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