Prevention and Treatment of Infectious Diseases in Healthcare Workers

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Objectives : *To study the prevention and treatment of infectious diseases offered to healthcare workers (HCWs) in Thailand.*
Material and Method : *Data were collected by interviewing in 2002.*
Results : *A total 1,218 HCWs in 33 hospitals were interviewed. Nurses and doctors were the majority group, accounting for 31.5% and 30.5% respectively. Pre-employement health screenings were done by physical examination in 56.0% and chest X-ray in 55.7% and immunization against hepatitis B and tubuculosis were offered in 17.7% and 11.4% respectively. Annual physical examination and chest x-ray were done in 66.3% and 76.9%. Reported infection with hepatitis A hepatitis B, tuberculosis in HCWs were as high as 16.8%, 4.0% and 2.6% respectively. Only 3.5% to 24.3% of HCWs ever read guidelines on the prevention of infection. Existing laws allowed the implementation of prevention, treatment and compensation in case of occupationally acquired infection in HCWs.*
Conclusion : *Prevention of infection in HCWs was implemented far below the ideal level. They should be better protected under existing laws.*

Keywords : *Prevention, Treatment, Infectious diseases, Healthcare workers*

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Health-care personnel are at risk of exposure to infectious agents while taking care of patients, handling of laboratory specimens or contaminated medical devices thus carry a greater risk of contracting infectious diseases than other prefessionals[1]. On the contrary, health-care personnel with contagious infections may transmit the agents to patients or other persons[2,3]. Therefore, prevention and therapy of infectious diseases among healthcare personnel are crucial measures to reduce the risk of infectious agent transmission in health-care facilities[4]. These measures can be done in several ways, including medical screening of immunity status and immunization, detection and eradication of carrier state, therapy of latent infections, chemoprophylaxis, and isolation/precaution of infectious patients. Work-related management of health-care personnel with infectious diseases should be based on medical evidence[5-7]. Compensation may be required in cases with proven occupationally-acquired infections[8-10]. In Thailand, there is no multi-centered nationwide study on medical and legislative aspects on prevention and treatment of infectious diseases among health-care personnel. The authors' primary objective was to describe how the health-care facilities across Thailand provided preventive and therapeutic services specifically in infectious diseases for their health-care personnel. Secondly, the present study was to describe the laws and regulations related to infectious diseases prevention and therapy for health-care personnel.

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Material and Method

The authors enrolled currently practicing health-care personnel in hospitals, including doctors, nurses, laboratory technicians, food handlers, medical device supply and laundry staffs and housekeepers in 33 public and private hospitals located in different parts of the country in 2002. Prior to the present study, an informed written consent had been given by individual subjects. Subjects in the present study were interviewed, using standardized questionnaires, by the co-investigators assigned in the individual hospitals. Questions consisted of pre-employment and annual medical screening, immunization, occupationally-acquired infections and practice guidelines available in health-care facilities. The study was approved by The Ethical Reviewer Board on Human Experiment of Mahidol University.

Laws and regulations were searched and collected by a co-investigator specialized in health care-related legislation. Laws and regulations of organizational, ministerial and national acts, rules, regulations related to prevention and therapy of infectious diseases and general medical disorders for health-care personnel were searched. Regulations covering compensation following exposure to infectious agents, employment status, and job leave were collected. Data were analyzed with the use of statistical computerized program SPSS for Windows® version 10.1. Continuous and categorical variables were expressed in frequency and percentages.

Results

Legal aspects

The Royal Edict on Medical Welfare for officials was issued in 1980. Medical expenditures on therapy of general medical disorders are covered or can be reimbursed from the Government of Thailand. The law covers exclusively government officials, not personnel in the private sector, and not specifically covering infectious diseases. There was no legislation covering any particular disease prevention for officials. In case of high risk settings, eg., health-care personnel with close contact to contagious infectious diseases, the charges of immunization and chemoprophylaxis may be covered on an individual basis, as stated in the Letter of the Ministry of Finance 0533/8234. Post-exposure prophylaxis, may be covered or compensated, stated by the Royal Act for Officials with occupationally-acquired injury or illness, issued in 1955. Specifically on HIV/AIDS, there was the Finance Ministerial Regulation on compensation for occupationally-acquired HIV-infected health-care providers, issued in 1997, revised in 1999. Government officials or private health-care personnel are all covered by the law. The proven occupationally-acquired HIV–infected individual will be eligible for 1.5 million baht compensation and 0.3-0.5 million baht for their spouses and children.

Medical aspects

Data were collected from July to November 2002 from 1,218 health-care personnel in 33 participating hospitals. Approximately 68 health-care personnel in each hospital were enrolled in the present study. Participating hospitals comprised 23 district, provincial and regional, 5 university and 5 private hospitals. These hospitals were located in all regions of Thailand. Types of health-care personnel in the present study are shown in Table 1. Majority (854/1,218, 70.1%) of subjects were doctors, nurses and medical technicians.

Pre-employment medical screenings

Among participants, 28.7-56.0% of total subjects underwent pre-employment and annual medical screenings. The most common screenings were physical examination and chest x-ray. One-third were

Table 1. Category of health-care personnel participating in the study

Category	No	%
Nurse	384	31.5
Doctor	371	30.5
Medical technician	99	8.1
Medical device reprocessing staff	77	6.3
Food service staff	76	6.2
Laundry staff	67	5.5
Housekeeper	73	6.0
Gardener	68	5.5
Others	3	0.2
Total	1,218	100

Table 2. Pre-employment medical screenings

Screening	No	%
Physical examination	675	55.4
Chest x-rays	670	55.0
Stool examination	34	2.79
Hepatitis B immunity	367	31.0

screened for hepatitis B immunity and for stool examination. Data are shown in Table 2.

Considering a particular group at high risk of transmitting infections, 51.4% (38/74) of the total food handlers had not been screened for intestinal parasites.

Almost all subjects, 98.2% (1,194/1,216) of total, considered medical screening essential prior to job placement. Types of screening are proposed in Table 3. A large proportion of subjects, 88.9% (474/533) preferred medical screening provided free by employers.

The rates of immunization were very low (1.2-17.7%) prior to employment as shown in table 4.

Among hepatitis B vaccine recipients, doctors were the group with the highest rate of immunization (29.5%, 107/363) followed by medical technicians 17.3% (17/98) and nurses 16.1%(59/367). Tetanus immunization to gardeners and housekeepers was found in 21.4% (15/70) and 15.9% (10/63) respectively.

Table 3. Screenings proposed by health-care personnel

Screening	No	%
Physical examination	1,140	96.9
Chest x-rays	1,135	96.4
Hepatitis B immunity	1,087	92.4
Fecal examination	848	72.0
Miscellaneous	304	25.8

Table 4. Pre-employment immunization

Immunization	No	%
Hepatitis B	212	17.7
Tetanus	189	15.8
BCG	136	11.4
Rubella	86	7.2
Measles	82	6.9
Varicella	33	2.8
Influenza	14	1.2

Table 5. Post-employment annual medical screening

Screening	No	%
Physical examination	798	66.3
Chest X-ray	934	76.9
Fecal examination	561	46.9

Annual medical screening

The majority of subjects received an annual physical examination and chest X-ray (66.3% and 76.9% respectively). Fecal examination was the least common screening, (46.9% of total). (Table 5)

The group who most frequently underwent annual medical screening were doctors (88.9%) followed by nurses (75.6%). A higher rate of fecal examination was found in food handlers before than after employment, 48.6% (36/74) and 89.3% (67/75), respectively.

Occupationally-acquired infections

Infections thought to be acquired occupationally were reported in 232 (19.0% of total subjects). Types of infections are shown in Table 6.

In the management of health-care personnel with occupationally-acquired infections, the authors found that 90.6% of the subjects received medical therapy free of charge and 34.3% were granted duty leave. Thirteen HCWs (1.3%) reported that they were punished because of the illness.

As shown in Table 7, guidelines and work instructions regarding infection prevention were recognized by the health-care personnel as low as 3.5 to 24.3 %.

Table 6. Occupationally-acquired infections

Infections	No	%
Hepatitis A	205	16.8
Rhinopharyngitis	113	9.3
Hepatitis B	49	4.0
Hepatitis C	37	3.0
Tuberculosis	32	2.6

Table 7. Guidelines and work instructions on infection control recognized by the HCWs (N=1218)

Topics	No	%
General	296	24.3
U.Ps.	245	20.1
Sharps handling	94	7.7
Handwashing	64	5.3
Waste disposal	52	4.3
Disinfection	43	3.5

Table 8. Means to improve infectious diseases prevention in health-care facilities (N=1218)

Means	No	%
Training/education	229	18.8
Provision of protective Devices	167	13.7
Establishing work Instruction	119	9.8
Setting up special unit to manage	84	6.9
Setting a clear national policy	63	5.2

Means to improve infectious disease prevention in health-care facilities were suggested by the subjects, results were shown in Table 8.

Discussion

In developed countries, health-care facilities are required to provide pre and post-exposure prevention of infectious diseases to health-care personnel, particularly the ones at risk. In 1983 and 1998, The Center for Disease Control and Prevention, USA, issued specific guidelines on management of infectious diseases among health-care personnel. Health-care facilities were recommended to incorporate interventions into hospital infection control, including : pre-employment medical screening of immunity status and immunizations, antimicrobial therapy and prophylaxis, patient isolations/precautions, disease reports and confidentiality of medical records, etc[10]. Periodic medical screenings are selectively done in specific situations, eg., outbreak of infectious diseases, replacement of job with different risks, etc. There are also job-related management of health-care personnel with infectious diseases, eg., exclusion from total patient care or from care of patients highly susceptible to infection. The laws and regulations in Thailand cover welfare for government officials. There were no regulations or laws specifically focusing on infectious diseases in health-care personnel. There is no requirement by law for pre and post employment screening, immunization for health-care personnel.

Health-care personnel, were sub-optimally screened for immunity and carriage of infectious diseases before admission into healthcare facilities. Medical screenings were not specific for infectious diseases. Tests specific for infectious diseases, ie., hepatitis B antibody and fecal examination, were done in less than one-third (Table 2). Carriage of food-borne agents among food handlers, was not screened for properly. This finding suggests that the risk of transmission of disease by foods and beverages is high in hospitals. The data indicate that pre-exposure prevention of infectious diseases to healthcare personnel in Thailand are to be improved (Table 4). Hepatitis B, influenza and mumps-measles-rubella vaccinations are recommended in developed countries for non-immune health-care personnel age less than 40 years.[10] Occupationally-acquired hepatitis A, hepatitis B and rhinopharyngitis in the present study indicates inadequate vaccination as well as improper isolation/precaution measures.

In the present study, management of health-care personnel with infectious diseases is partly considered inappropriate particularly work-related issues. In developed countries, health-care personnel with communicable diseases are required to be excluded from direct patient care, susceptible patients, or total patient contact, depending on specific disease categories. Punishment is prohibited, in order to facilitate disease report to responsible units. However, compensation will not be given to exposed health-care personnel without clinical infection.[11] The health-care personnel were aware of the significance of infection control in health-care facilities, strategies to improve infection control were suggested (Table 8).

Conclusion

The present study demonstrates insufficient management of infectious diseases preventive measures among health-care personnel in public and private health-care facilities both in medical and legal aspects. Pre-exposure and post-exposure management are both sub-optimal. Prevention and treatment of infectious diseases among health-care personnel in Thailand need to be improved.

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References

1. Melius JM. Prevention of occupationally acquired infection in prehospital healthcare workers. In: Mayhall CG, editor. Hospital epidemiology and infection control. Philadelphia: William & Wilkins, 1996: 892-6.
2. Centers for Disease Control. Update: investigation of persons treated by HIV infected health-care workers, United States. MMWR 1993; 42: 329-31.
3. Fekety FR Jr. The epidemiology and prevention of staphylococcal infection. Medicine 1964; 43: 539-43.

4. Tablan OC, Bolyard EA, Shapiro CN, Williams WW. Personnel health services. In: Bennett JV, Brachman PS, editors. 4th ed. Hospital infections. Philadelphia, New York: Lippincott-Raven, 1998: 23-52.
5. Doebbeling BN. Protecting the healthcare worker from infection and injury. In: Wenzel RP, editor. Prevention and control of nosocomial infections. 3rd ed. Philadelphia: Williams & Wilkins, 1997: 397-435.
6. Haley RW, Emori TG. The employee health service and infection control in U.S. hospitals. JAMA 1981; 246: 844-7.
7. Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchman SD. Guideline for infection control in healthcare personnel 1998. In: APIC Text of infection control and epidemiology. Washington: Association for professionals in infection control and epidemiology, Inc. APIC 2000: 79A-1-67.
8. Klein JO. Management of infections in hospital employees. Am J Med 1981; 70: 919-23.
9. Brown TC, Kreider SD, Lange WR. Guidelines for employee health services in hospitals, clinics and medical research institutions. J Occupat Med 1983; 25: 771-3.
10. Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchman SD, et al. Guideline for infection control in health care personnel, 1998. AJIC 1998; 26: 289-354.
11. Herwaldt LA, Pottinger JM, Carter CD, Barr BA, Miller ED. Exposure workups. Infect Control Hosp Epidemiol 1997; 18: 850-71.

การป้องกันและรักษาโรคติดเชื้อของบุคลากรทางการแพทย์

สมหวัง ด่านชัยวิจิตร, ยงค์ รงค์รุ่งเรือง, แสวง บุญเฉลิมวิภาส, อำนาจ กุสลานันท์, ยุวดี ตันติวัฒนาไพบูลย์

วัตถุประสงค์ : *ศึกษาการป้องกันและรักษาโรคติดเชื้อของบุคลากรทางการแพทย์*
วัสดุและวิธีการ : *เก็บข้อมูลโดยการสัมภาษณ์บุคลากรทางการแพทย์ใน พ.ศ. 2545*
ผลการศึกษา : *สัมภาษณ์บุคลากร 1,218 คนใน 33 โรงพยาบาล ทั่วประเทศ ส่วนใหญ่เป็นพยาบาลและแพทย์ (31.5% และ 30.5% ตามลำดับ) การตรวจสุขภาพก่อนรับเข้าปฏิบัติงานกระทำโดยการตรวจร่างกาย 56.0% และฉายภาพรังสีทรวงอก 55.7%, ตรวจหาภูมิคุ้มกันไวรัสตับอักเสบ บี 17.7%, วัณโรค 11.4% การตรวจสุขภาพประจำปีโดยการตรวจร่างกายและภาพรังสีทรวงอก 66.3% และ 76.9% ตามลำดับ บุคลากรรายงานโรคติดเชื้อที่อาจจะได้รับจากการปฏิบัติงานได้แก่ ตับอักเสบจากไวรัสชนิด เอและบี วัณโรค 16.8%, 4.0% และ 2.6% ตามลำดับ บุคลากรได้อ่านแนวทางปฏิบัติเพื่อป้องกันโรคติดเชื้อเพียง 3.5% ถึง 24.3% กฎหมาย และระเบียบที่มีอยู่ในประเทศไทยสามารถนำมาประยุกต์ใช้ในการรักษาและป้องกันการติดเชื้อของบุคลากรทางการแพทย์ได้ แม้ไม่มีกฎหมายหรือระเบียบเกี่ยวกับโรคติดเชื้อโดยตรง*
สรุป : *การป้องกันและรักษาโรคติดเชื้อในโรงพยาบาลสำหรับบุคลากรทางการแพทย์ยังอยู่ในระดับต่ำกว่าที่ควรจะกระทำ บุคลากรทางการแพทย์ควรจะได้รับความคุ้มครองมากกว่านี้ภายใต้กฎหมายที่มีอยู่*