Abstract Healthcare waste management is a serious public health concern. In developing countries, compared to developed nations, the management of infectious wastes has not received sufficient attention. Recently, worldwide awareness has grown of the need to impose stricter controls on the handling and disposal of wastes generated by healthcare facilities. This exploratory study attempted in seven selected hospitals to explain the situation of healthcare waste management, with a focus on handling practices, occupational safety, and the implementation status of waste management policy, together with other pertinent policy issues. It was noted that the current system of healthcare waste management was underdeveloped and was in dire need of immediate attention and improvement, especially in Mongolia and Pakistan; the medical waste management practices were better in the hospitals studied in Thailand. This study underscores the importance for improvement of medical waste management of a national regulatory framework, a sound internal management system, and programs to train and ensure the safety of related personnel, as well as programs to estimate quantities of waste generated and to evaluate appropriate techniques of disposal. Once a healthcare waste management plan has been prepared, a regular program of inspection and review can be undertaken within the healthcare institution. A good inspection program can also expose problems and new issues in managing healthcare wastes.

Key words Hospital waste management · Infectious waste · Occupational hazard · Mongolia · Pakistan · Thailand

Introduction

Medical waste management is a crucial public health and environmental issue, because poor medical waste management unquestionably exposes healthcare workers, waste handlers, and the community to infections, toxic effects, and injuries, and poorly designed and operated incinerators can emit numerous pollutants which are harmful to human health and bodily functions.1,2

It is now commonly recognized that certain categories of medical waste are among the most hazardous and potentially dangerous of all wastes arising in a community.3,4 Relatively large quantities of medical waste with a broad range of compositions and characteristics can be generated from various kinds of therapeutic procedures, such as infectious wastes, sharp objects, and hazardous chemicals. The World Health Organization (WHO) has advocated that hospital wastes should be treated as special wastes.5 The US Environmental Protection Agency (EPA) has also defined medical wastes as hazardous.6

Healthcare waste products should be considered a reservoir of pathogenic microorganisms, potential causes of contamination and infection.7 As the volume and the complexity of healthcare wastes increase, the risk of transmitting diseases through unsafe handling and disposal practices also increases. The inefficient handling of biomedical wastes is more likely to cause such problems as transmission of blood-borne pathogens to the groups at highest risk, namely healthcare staff, scavengers, and municipal workers. According to a survey by the WHO on medical waste management in 22 developing countries, inappropriate methods accounted for between 18% and 64% of waste disposal methods.7 A study has pointed out the strong possibility that such diseases as AIDS, hepatitis B, hepatitis C,8 and tuberculosis could be transmitted to facility workers handling these hazardous wastes.9,10

Medical wastes have received insufficient attention in developing countries.11 There is growing awareness worldwide of the need to impose stricter controls on the handling and disposal of wastes generated by healthcare facilities.12
In many countries, hazardous and medical wastes are still handled and disposed of together with domestic wastes, exposing municipal workers, the public, and the environment to major health risks. Comprehensive efforts have not been made to understand how wastes generated by hospitals, clinics, and other healthcare settings are managed. Management of wastes usually is delegated to poorly educated laborers who perform most activities without proper guidance and insufficient protection.

Studies have indicated that, to improve medical waste management, it is important to have a national regulatory framework, sound internal management systems, and programs to train and ensure the safety of related personnel, as well as programs to estimate quantities of waste generated and to evaluate appropriate techniques of disposal. The WHO has provided comprehensive guidelines on safe, efficient, and environmentally sound methods for the handling and disposal of medical wastes.

This exploratory study attempted to explain the situation of healthcare waste management in seven selected hospitals in three Asian countries, with a focus on handling practices, occupational safety, and the implementation status of waste management policy together with other pertinent policy issues.

Materials and methods

This was a cross-sectional descriptive study designed to explore the perceptions of managers regarding health waste management at their hospitals. The techniques used were qualitative; besides observation, in-depth interviews were conducted with managers and key personnel in the hospitals’ healthcare waste management.

The study was conducted in three Asian countries, Thailand, Pakistan, and Mongolia, which are at various stages of economic development. In Thailand, from the public sector, we included King Chulalongkorn University teaching hospital, and in the private sector, we included two hospitals, Bangkok Hospital and BNH Hospital, all tertiary care facilities. In Pakistan, the study sample consisted of the two main hospitals in Rawalpindi city; both Rawalpindi General Hospital (public) and Rawalpindi Railway Hospital (private) are tertiary care teaching hospitals. In Mongolia, two major hospitals participated in the study: NCCD Hospital and Hospital 3 in Ulaanbaatar city. These hospitals represented major tertiary care hospitals in their respective countries.

Interviews were completed with the directors and relevant key persons in infection control and waste management in all hospitals. We focused on the presence in the facilities of information, education, and communication (IEC) materials such as biohazard markings, safety precautions, national regulations, internal policies, storage places, and handling practices related to waste and the training of health workers. The principal investigator also visited all the study sites to observe practices in the stages of waste segregation, collection, containment, storage, transportation, and disposal of medical waste in healthcare settings. The questionnaire was piloted and modified before full-scale study implementation.

The data were collected in 2007 after permission was obtained from the hospitals’ institutional review boards. A total of 15 interviews were undertaken with managers in their work places. Open-ended questionnaires with probes were used during face-to-face interviews. Data analysis was done based on statements, meanings, themes, and general descriptions of experience that emerged out of the responses.

Brief description of the hospitals

Rawalpindi General Hospital. This hospital, in Rawalpindi, Pakistan, is a major tertiary care teaching hospital offering the basic specialties such as internal medicine, surgery, gynecology and obstetrics, otorhinolaryngology, and ophthalmology as well as psychiatry, orthopedics, urology, radiology, and cardiology. It is a 400-bed hospital with an approximate yearly outpatient population of 400,000.

Pakistan Railway Hospital. This hospital, also in Rawalpindi, Pakistan, is a tertiary level care teaching hospital. It covers all the major specialties, e.g., medicine, surgery, pediatrics, otorhinolaryngology, ophthalmology, gynecology, orthopedics, dermatology, and psychiatry. It has 400 beds and has an annual outpatient population of 250,000.

Hospital 3. Hospital 3 is a tertiary care hospital in Ulaanbaatar, Mongolia. It has 400 beds and on average has an outpatient population of 90,000 patients yearly. Its main specialties, besides the basics, are cardiology, neurology, neurosurgery, pulmonology, endocrinology, ophthalmology, and nephrology. It also has special units for cardiac and neurosurgery.

NCCD Hospital. The NCCD Hospital is also situated in Ulaanbaatar, Mongolia. It has 510 beds and an annual outpatient population of 150,000–200,000. Besides the basic specialties such as medicine, surgery, gynecology and obstetrics, otorhinolaryngology, and ophthalmology, it also has specialty units in hemodialysis, nephrology, hematology, urology, and endocrinology, among others.

King Chulalongkorn Memorial Hospital. This hospital provides complete primary and also extensive tertiary care medical services for the population of Bangkok and for referred cases from the provinces. It has over 1500 beds in various specialties. Besides offering the basic specialties such as medicine, surgery, gynecology and obstetrics, otorhinolaryngology, and ophthalmology, in addition it offers psychiatry, pediatrics, orthopedics, urology, radiology, dermatology, plastic surgery, and cardiology.

Bangkok General Hospital. This hospital, located in Bangkok, Thailand, is currently one of the country’s largest