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The Treatment of Waste Materials Arising from Medical Institutions and Home Health and Medical Care Services：What Do Regional Medical Associations Require for the Safe and Effective Management of These Materials？

Takuya IMATOH[1)], Motonobu MIYAZAKI[1)2)], Masaru HARADA[3)] and Hiroshi UNE[1)]

[1)] *Department of Hygiene and Preventive Medicine, School of Medicine, Fukuoka University*
[2)] *Department of Health and Welfare, Saitama City Government*
[3)] *Department of Community Medicine, The Japan Medical Association*

Abstract：Due to the increase in the quality and quantity of waste materials disposed of from medical institutions and home health and medical care services (HHMC), the management of such materials has become increasingly important in order to protect the persons concerned from infectious diseases. A half of Regional Medical Associations (RMAs) fixed the person in charge for waste material treatment. RMAs that fully understood the manual for infectious waste treatment comprised only 37.5%. Regarding HHMC waste materials, the main obstacles were the expenses of management and the interpretation of the Waste Disposal Law. In addition, only 37.8% of the RMAs communicated with the waste workers. On the other hand, approximately 70% of RMAs considered that the municipal government should collect and transport HHMC waste materials. In our study it became apparent that increased communication between RMAs and the municipal governments was needed in order to establish improved rules for the collection and transportation of HHMC waste materials while, in addition, the development of an impenetrable–portable container with a lid, so as not to injure the municipal workers of HHMC waste treatment, was also needed.

Key words：**Regional Medical Association, Waste management, Medical care, Home healthcare.**

Introduction

Waste management in Japan is performed in accordance with the Waste Disposal and Public Cleansing Law (the Waste Disposal Law) of 1970. Waste materials are classified as industrial and general household or municipal wastes. Industrial waste materials are generated as a result of industrial activities；and general household waste materials are referred to as "waste materials other than industrial waste". Infectious waste materials from hospitals and clinics (medical institutions) are included in industrial waste classification, and are categorized as a type of hazardous waste material.[1)]

The waste generated from the treatment of patients suffering from infectious diseases may spread infection either through direct contact or indirectly through the environment. The management of these infectious waste materials is regulated under the amended Waste Disposal Law of 1992. Regulations covering the treatment of infectious waste materials from medical institutions

Correspondence address；Takuya IMATOH M.Sci.
Department of Hygiene and Preventive Medicine, School of Medicine, Fukuoka University
7–45–1 Nanakuma, Jonan–ku, Fukuoka City, Fukuoka 814–0180, Japan

were revised in 2004.[2] On the other hand, waste materials originating from home health and medical care services (HHMC) are still included in general household waste materials, even when such waste materials the wastes are infectious. The management of such infectious waste materials disposed of from private homes is not regulated.[3]

The purpose of this study is to investigate the present opinions of the Regional Medical Associations (RMAs) under the Japan Medical Association regarding infectious waste materials and HHMC waste materials ; and to determine safe management strategies for medical institutions dealing with such waste materials.

Materials and Methods

This study describes the present infectious and HHMC waste management practice in Japan. In order to evaluate the management practice of infectious waste materials disposed of from medical institutions and HHMC waste materials arising from home health and medical care services, we selected all RMAs. The mail survey was performed in cooperation with the Japan Medical Association (JMA). We mailed a questionnaire including information on the disposal of infectious waste materials and HHMC waste materials to 854 RMAs. Regarding the method of the respondent's answers, all answers were circled and multiple answers were allowed for each question.

Results

The survey response rate was 80.1% for RMAs. Responses were received from 684 RMAs. The information in Table 1 shows the present establishment of RMA about waste materials originating from medical institutions and home health and medical care cervices. The person in charge for the treatment of waste materials was in a permanent position in 51.7% of all RMAs. 42.8% of the RMAs understood the manual for infectious waste treatment published by the Ministry of Environment. In addition, 70.5% of the RMAs supported the idea that the municipal governments should collect HHMC waste materials.

The information in Table 2 shows the main obstacles for the management of HHMC waste materials. 44.5% of RMAs reported the expenses of such management ; 25.1% for sharp objects and 19.4% for non-sharp objects. Except for problems regarding financial resources, 23.7% noted difficulties in interpreting the Waste Disposal Law while the remainder noted problems in the collection and transportation of waste materials.

The information in Table 3 shows the collection and transportation of HHMC waste materials by the municipal governments. 64.9% of the municipal governments refused to collect and transport

Table 1. Present establishment of Regional Medical Association on infectious waste management (n=650)

	%
Is the person in charge fixed ?	
Yes	51.7
No	42.8
Do you understand the manual on infectious waste ?	
Yes	37.5
No	50.8
Mucipal governments should collect home health and medical care waste materials.	
Yes	70.5
No	14.6

No answer is excluded.

Table 2. Main obstacles in the management of home health and medical care waste materials(n=748)

	%
Cost of management comes expensive	
Sharp objects	25.1
Non-sharp objects	19.4
Interpretation of the Waste Disposal Law	23.7
Self-transportation to a medical institution	15.9
Disposal methods	15.5
Transportation by nurses	13.2
Safety of transportation by patients	9.1
Others	2.8

Multiple answers are allowed.

Table 3. Collection and transportation of home health and medical care waste materials by municipal governments (n=599)

	%
Yes	31.4
No	64.9
Others	4.7

Others : Municipal governments allow waste materials to be transported by medical institutions.
No answer is excluded.

such materials, while 31.4% of the municipal governments treated waste materials related to home health and medical care services at home.

The information in Table 4 shows the communication between RMAs and waste offices of the municipal governments dealing with the management of general household wastes. Two hundred and sixty-three (37.8%) RMAs communicated with the waste workers concerned. However, 58.4% of RMAs have never contacted the municipal governments.

The information in Table 5 shows the general-infectious waste materials which the municipal governments collect and transport at present. Only 76 (11.0%) municipal governments collected and transported all general-infectious waste materials disposed of by medical institutions. 68.4% of them did not collect all general-infectious waste related to medical treatment at medical institutions.

The information in Table 6 shows the treatment of HHMC waste materials arising from home. Except for the self-judgment of medical institutions, 47.5% of medical institutions collect sharp objects. The remainder was 4.4% by pharmacies and 2.5% by the municipal governments. Regarding non-sharp objects, 26.8% of medical institutions collect them while 12.9% of the municipal governments and 1.2% of pharmacies do so.

The information in Table 7 and Table 8 shows how medical institutions collect sharp objects of HHMC waste materials. 57.6% of the municipal governments shared the expenses, while 53.0% of the municipal governments gave out containers to patients or their families. It was, however, reported that nothing was required in 18.2%.

Discussion

In Japan, infectious wastes are defined as the waste materials generated in medical institutions

Table 4. Communication with municipal governments (n=695)

	%
We communicate with municipal governments	22.4
We have communicated in the past with municipal governments	15.4
We have not communicated with municipal government	58.4
Others	3.8

No answer is excluded.

Table 5. Collection of general-infectious waste materials by municipal governments that have been discarded by medical institutions (n=694)

	%
Municipal governments collect and transport all general-infectious waste materials	11.0
Municipal governments partially collect and transport general-infectious waste materials	10.2
Municipal government do not collect and transport general-infectious waste materials	68.4
Others	10.4

No answer is excluded.

Table 6. Treatment of home health and medical care waste materials

	Sharp objects (n=710) %	Non-sharp objects (n=706) %
Medical institutions treat waste materials according to their own judgement	57.2	53.4
Medical institutions collect waste materials	47.5	26.8
Pharmacies collect waste materials	4.4	1.2
Municipal governments collect waste materials	2.5	12.9
Others	11.4	5.7

Multiple answers are allowed.

Table 7. Requirements that medical institutions collect home health and medical care waste materials (n=700)

	%
Municipal governments share the expenses	57.6
Municipal governments give out the package to patients	53.0
Nothing	18.2
Others	4.6

Multiple answers are allowed.
No answer is excluded.

Table 8. Problems related to the fact that medical institutions collect sharpe objects of home health and medical care waste materials (n=702)

	%
Cost of management is expensive (medical institution)	81.5
Cost of management is expensive (home-visit nursing)	52.4
Cost of management is expensive (patients/their families)	40.0
Responsibility for disposal accidents	31.2
Others	3.4

Multiple answeres are allowed.

as a result of medical care or research which contain pathogens that have the potential to transmit infectious diseases. On the other hand, waste materials originating from HHMC wastes are still included in general household waste materials, even when the wastes are infectious.[4] In addition, the establishment of home health and medical care services is a basic requirement of the general population in recent years. Both medical devices and instruments are used while treating patients at home, thereby producing a variety of waste materials. However, the management of HHMC waste materials arising from private homes is not regulated.

The JMA has never carried out a survey about infectious waste materials disposed of from medical institutions and HHMC waste materials arising from private homes. Therefore, this study was the first survey performed through the JMA. The manual for infectious waste management is not well understood by over a half of the RMAs and only a half of the RMAs in charge of waste materials are in permanent positions. These facts suggest a lack of understanding of knowledge by RMAs regarding the management of infectious waste materials, although the treatment of infectious waste materials has been stipulated since 1992.

Because infectious waste materials disposed of from medical institutions are not collected or transported by the municipal governments, medical institutions most normally pay all expenses. Each medical institution, therefore, has to contract a specified business authorized by a prefectural government for the treatment of infectious waste and a disposal costs are thus becoming a serious matter. In addition, not all medical institutions have obtained exact information on each special infectious waste business including their qualities, such as the number of years dealing in infectious waste and an existence of violation, and a treatment price. It is expected that a training course in cooperation with the Japan Industrial Waste Technology Center will be held from 2006. In addition, to protect RMAs from unlawful acts, an information system for good specified businesses should be also developed by JMA.

Regarding the troublesome problems that medical institutions have in managing HHMC waste materials, approximately 25% of RMAs reported the expenses of sharp objects management and the interpretation of the Waste Disposal Law to each other. In comparison to a previous study,[5] 44.5% of the results on expenses was clearly a lower ratio than 75.0% of the previous study. It is thought that this difference is related to the target group and the number of subjects between the two studies. To evaluate the main obstacles of medical institutions, it is therefore necessary to directly investigate all medical institutions belonging to

RMAs.

A quarter of RMAs reported that the municipal governments collect and transport HHMC waste materials and a half of them reported that they did not collect such materials. The refusal ratio was the same between this study and our previous study.[6] About three fourths of the RMAs judged that the municipal governments should collect and transport HHMC waste materials. The fact that the municipal governments do not also collect and transport general–infectious waste materials disposed of from medical institutions expresses the strong rejection of municipal governments for handling infectious and HHMC waste materials.

Municipal workers are worried about needle stick accidents when collecting or transporting wastes. Some researches report that approximately 30% of the municipal governments have experienced needle stick accidents.[5)–8)] Although 30% of the RMAs have experience in discussing such problems with municipal governments, half of these RMAs reported that the municipal governments really collect and transport HHMC waste materials and general–infectious waste materials. This ratio was higher than that for RMAs which have never discussed such problems with the municipal governments. These facts suggest that it is extremely important that RMAs make themselves understood when meeting with municipal governments. However, there seems to be differences of opinion between RMAs and the municipal governments regarding the most appropriate methods for collecting and transporting HHMC waste materials.[5] A number of difficulties are being faced regarding the implementation of the safe and effective management for HHMC waste materials. The communication and cooperation of RMAs and the municipal governments is thus needed in order to establish improved rules for the collection and transportation of HHMC waste materials.

Regarding sharp objects of HHMC waste materials, such as injection needles, about a half of all medical institutions collected such materials. This result was a lower ratio than the 87.5% reported in our previous study.[5] Regarding non–sharp objects, such as continuous ambulatory peritoneal dialysis (CAPD) bags and Cotton battings, 26.8% of medical institutions collected such materials. This result was almost the same as in our previous study.[5] The municipal governments have to collect general household wastes from homes and transport them to incineration or recycling plants under the Waste Disposal Law. Non–sharp objects of HHMC waste materials are normally expected to be collected and transported. On the other hand, there is no reason that municipal workers have to manage all general household wastes and therefore put themselves at risk of infection. The potential for causing infection varies greatly depending on the sharpness and quality of wastes. The opinions regarding the optimal treatment of sharp objects are clearly different between RMAs and municipal governments. The containers for disposal of sharp objects should be collected and transported separately from general–household waste materials, because an injury from this type of waste must be avoided. We propose the development of an impenetrable–portable container with a lid so as not to injure the persons concerned. If a container can be developed by superior enterprises, then both waste workers of the municipal governments and patients and their families can also treat sharp objects in safety.

It is the fact that the collection of sharp objects by medical institutions is a good strategy for preventing waste workers from needle stick accidents. However, cost–effective management is also needed.[9] Taking expenses and safety into consideration it is likely to be good idea that the municipal governments collect and transport all HHMC waste materials, if a disposable–safe container can be developed in the future. For the proper treatment of HHMC waste materials, it is essential that RMAs and the municipal governments try to understand each other. Therefore each RAM should approach the persons concerned in the municipal government with a realistic proposal. In addition, JMA should not impose the opinion of the JMA upon RMAs, but should respect the ideas of the RMAs.

Conclusions

The extent to which appropriate systems for the collection and transportation of HHMC waste ma-

terials are used is important. The cooperation of the persons concerned is needed to constitute an appropriate management system of HHMC waste materials. This study clearly indicated the main obstacles facing RMAs. The fact remains that 65% of the municipal governments refuse to collect and transport such materials. It is, therefore, important that a mutual understanding be achieved and the person in charge of these matters should also be in a permanent position at RMAs. Another important key is the development of a disposable container for the safe collection and transportation of HHMC waste materials.

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