

<Research Data>

A Survey of Preventive Measures Against Tuberculosis in Nursing Care Insurance Facilities and Preventive Education Activities on the Basis of the Collected Data

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Summary : The most epidemiologically remarkable problem in Japan is that the aged infected with tuberculosis decades ago are on the increase and the incidence rate of tuberculosis is on the rise owing to the occurrence of medical risk factors such as diabetes mellitus. Therefore, it is possible that once a resident in a facility catches tuberculosis, tuberculosis infection spread among employees and other residents in the facility.

The Tuberculosis Prevention Act obliges the head of a facility for the aged to make periodical health checkup (chest X-p) of the aged. However, in some facilities the bed-ridden aged failed to receive chest X-p test and the head failed to grasp health conditions of the aged.

Considering these situations, we gathered information of health care system and employees' perception of tuberculosis from nursing care insurance facilities by the questionnaire method for the purpose of giving preventive education on tuberculosis to care staff on the basis of the collected data and preventing the spread of tuberculosis at facilities. In this survey, we contrasted respondents from nurses and these from care staff. It is natural that nurses educated in medicine are richer in understanding tuberculosis than care staff. On the basis of the collected data, we delivered lectures on tuberculosis for employees in nursing care insurance facilities. We recognize that these sessions have done work in nursing care workers taking preventive measures against tuberculosis.

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Key words: tuberculosis, prevention of tuberculosis, facilities for the aged, health center

1 Introduction

The rate of cases more than 60 years old to the newly registered tuberculosis cases is 56.4% in Japan (2001)¹⁾. The most epidemiologically remarkable problem in Japan is that the aged infected with tuberculosis decades ago are on the increase and the incidence rate of tuberculosis is on the rise owing to the occurrence of medical risk factors such as diabetes mellitus.

It was recently reported that tuberculosis spread in facilities for the aged. The incidence of tuberculosis among residents in nursing homes for the aged is relatively high, because there are many elderly persons who are bed ridden and have a low resistance to infectious disease. Therefore, it is possible that once a resident catch tuberculosis, tuberculosis infection spread among employees and other residents in a facility. More and more aged will enter facilities without immunization with tuberculosis. The present task is that medical staffs prevent the

aged from getting tuberculosis, detect tuberculosis patients in an early stage, put on appropriate regimen and make health care to young "contacts" surroundings cases²⁾.

The Tuberculosis Prevention Act obliges the head of a facility for the aged to make periodical health checkup (chest X-p) of the aged. However, in some facilities the bed-ridden aged failed to receive chest X-p test and the head failed to grasp health conditions of the aged. In day care facilities users failed to receive chest X-p test under no obligation of receiving chest X-p test. Therefore, there are possibilities of tuberculosis spreading in day care facilities for the aged, too²⁾.

Both 'care staff' and 'nurses' have daily direct contact with residents. However, care staff are poorer in understanding tuberculosis than nurses educated in medicine. Considering these situations, we gathered information of health care system and employees' perception of tuberculosis from nursing care insurance facilities by the questionnaire method for the purpose of giving preventive education on tuberculosis to care staff on the basis of the collected data and preventing the spread of tuberculosis at facilities. We recognize that these sessions have done work in nursing care workers taking pre-

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Table 1 Items of Questionnaires on Tuberculosis for Nursing Care Insurance Facilities

1. Questionnaires for Nursing Care Insurance Facilities
1) Employees
(1) Medical Checkup at Employment
Chest X-P
Tuberculin Skin Test
Method of 2-Step Tuberculin Skin Test
(2) Periodical Health Checkup
Chest X-P
(3) Observation of Health Status of Residents
2) Residents
(1) Health Checkup just after the Aged was Admitted to a Facility
(2) Periodical Health Checkup
(3) Daily Observation of Health Status of Residents
2. Questionnaires for Day Care Facilities
1) Users (the Aged)
(1) Health Checkup when the Aged Used a Day Care Facility
(2) Observation of Health Status of Users
3. Employees' Understanding of Tuberculosis
1) Demographic Attributes
Sex and Age, Job Categories
2) Perception and Understanding of Tuberculosis
Perception of Tuberculosis, Opportunities to Catch Tuberculosis, Medical Treatment, Route of Infection
3) Health Care System for Employees
Chest X-P, Reasons for Non-Participation in Health Checkup, Tuberculin Skin Test,
4) Grasp of Risk Factors for Tuberculosis of the Aged, Opportunities to Get Information about Tuberculosis

ventive measures against tuberculosis.

2 Subjects and Methods

In January 2002, we conducted investigations into the actual condition of periodical health checkup of the aged and employees, health care system of the aged and grasping health conditions of the aged through questionnaires to 24 nursing care insurance facilities through our area of jurisdiction. We gathered information of understanding of tuberculosis from employees in nursing care insurance facilities. The objected items are tabulated in Table. 1.

24 facilities for the aged consist of 9 hospitals of nursing medical care, 6 health facilities, 7 welfare facilities, one care facility and one nursing care facility. We sent out questionnaires to subjected facilities of investigation and collected them from each facility.

Data were analyzed using the statistical software package JMP4J (SAS Institute Japan, 2001). Chi-square analyses were used to test for differences between "care staff" and "nurses".

A significance level of $p < 0.05$ was chosen. When the software package issues a warning that one of the cells is less than 5 and χ^2 value is incredible, we did not conduct statistical tests.

3 Results

3.1 Collection of Questionnaires

We obtained questionnaires from all 24 facilities (100%). 754 employees returned questionnaires for a response rate of 93.7% (754-for-805).

3.2 Health Care System in Facilities

The actual results of medical checkup at employment are tabulated in Table. 2. In only 2 facilities tuberculin skin tests were conducted and in one facility of them the method of 2-step tuberculin skin test was introduced.

The actual results of periodical medical checkup of the aged in the facilities are tabulated in Table. 3. In all 24 facilities periodical medical checkup and questioning about case history of the aged were conducted, but in any facility sputum examina-

Table 2 Medical Checkup at Employment

Checkup Items	Number of Facilities
Chest X-P	20 (83.3%, 20/24)
Tuberculin Skin Test	2 (8.3%, 2/24)
2-Step Tuberculin Skin Test	1 (4.2%, 1/24)

Table 3 Periodical Medical Checkup of Residents by the Type of Facilities

Facility	Total	Chest X-P	Sputum Examination
Total	24	24	—
Hospital	9	9	—
Health Facility	6	6	—
Welfare Facility	7	7	—
Nursing Home	2	2	—

tion were not conducted.

3.3 Employees' Perception of Tuberculosis

3.3.1 The Attributes of the Sample

A job category of the sample is as follows (Fig. 1): 421 care staff (56% of sample), 167 nurses (22%), 71 clerks (9%), and 92 others such as dieticians, licensed cooks and physical therapists (12%).

Of these job categories, 'care staff' and 'nurses' have daily direct contact with residents. Therefore, we mainly analyzed the differences between "care staff" and "nurses".

Sample by job classification, sex and age, are shown in Fig. 2. The rate of care staff of 20-29 years to the sample is a high percentage (38.1%).

3.3.2 Items concerning Preventive Measures against Tuberculosis

Items concerning preventive measures against tuberculosis

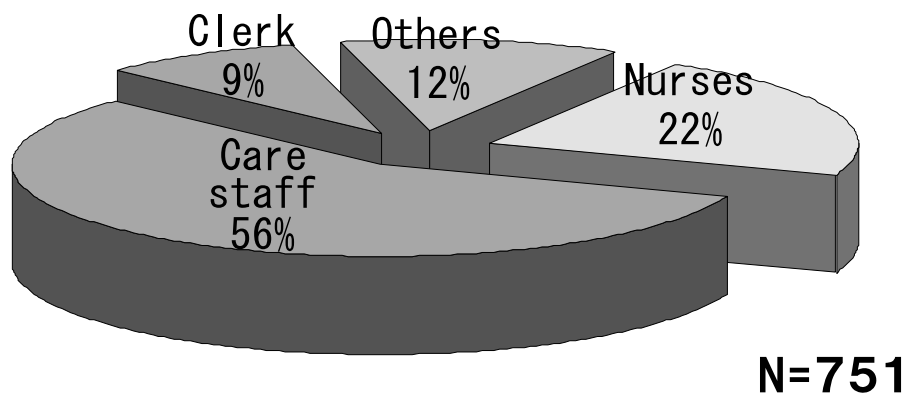


Figure 1 Occupational classification of the sample

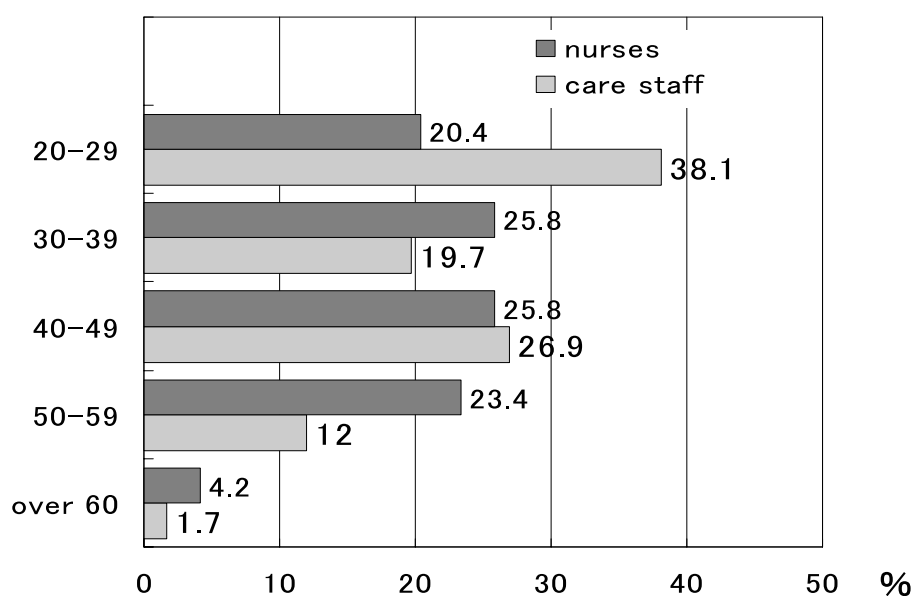


Figure 2 The sample by age and job categories

Table 4 Items concerning Preventive Measures against Tuberculosis by Job Categories and Age

Age (in Years)	under the age of 39		over the age of 40	
Job Categories	Nurses (N=78) (%)	Care Staff (N=248) (%)	Nurses (N=89) (%)	Care staff (N=171) (%)
Variable				
Perceived Risk of Catching Tuberculosis	$\chi^2=9.30, p=0.026$		$\chi^2=9.67, p=0.022$	
High	11(14.1)	13(5.2)	12(13.5)	14(8.2)
Relative High	29(37.2)	83(33.5)	26(29.2)	55(32.2)
Moderate	28(35.9)	125(50.4)	45(50.6)	67(39.2)
Low	8(10.3)	25(10.1)	6(6.7)	33(19.3)
Perceived Threat of Tuberculosis	$\chi^2=6.85, p=0.077$		$\chi^2=3.81, p=0.282$	
Strong	36(46.2)	106(42.7)	35(39.3)	77(45.0)
Relative Strong	27(34.6)	107(43.1)	26(29.2)	57(33.3)
Moderate	9(11.5)	28(11.3)	23(25.8)	30(17.5)
Weak	6(7.7)	5(2.0)	5(5.6)	5(2.9)
Tuberculosis Is a Past Disease ?	$\chi^2=11.42, p=0.010$		—	
Yes	11(14.1)	32(12.9)	3(3.4)	15(8.8)
Rather Yes	15(19.2)	86(34.7)	15(16.9)	52(30.4)
Rather No	23(29.5)	79(31.9)	19(21.3)	40(23.4)
No	29(37.2)	51(20.6)	52(58.4)	62(36.3)
At What Age People Are Liable to Catch Tuberculosis ?	—		—	
Young	6(7.7)	8(3.2)	12(13.5)	8(4.7)
Aged	32(41.0)	62(25.0)	20(22.5)	42(24.6)
No Differ	37(47.4)	145(58.5)	53(59.6)	100(58.5)
No Idea	3(3.8)	31(12.5)	4(4.5)	19(11.1)
Tuberculosis Is a Hereditary Disease or Infectious ?	—		—	
Both Hereditary and Infectious	14(17.9)	44(17.7)	8(9.0)	24(14.0)
Infectious	58(74.4)	177(71.4)	79(88.8)	136(79.5)
No Idea	1(1.3)	26(10.5)	1(1.1)	8(4.7)
Understanding Route of Tuberculosis Infection	—		—	
Contact with Tuberculosis Patients' Goods	—	4(1.6)	1(1.1)	6(3.5)
Cough and Sputum	72(92.3)	189(76.2)	86(96.6)	148(86.5)
Blood	3(3.8)	20(8.1)	2(2.2)	5(2.9)
No Idea	2(2.6)	33(13.3)	—	7(4.1)
Participation in Tuberculosis Checkup (Chest X-p)	—		—	
Every Year	66(84.6)	173(69.8)	85(95.5)	145(84.8)
Once in 2 or 3 Years	3(3.8)	13(5.2)	—	6(3.5)
Not for Years	4(5.1)	14(5.6)	1(1.1)	7(4.1)
No Idea	5(6.4)	46(18.5)	1(1.1)	10(5.8)
Reasons for Non-participation in Tuberculosis Checkup	—		—	
Busy	2(2.6)	3(1.2)	—	1(0.6)
Not to Realize the Value	2(2.6)	12(4.8)	—	6(3.5)
Forget	—	4(1.6)	1(1.1)	2(1.2)
under Treatment	—	2(0.8)	—	2(1.2)
Grasping Risk Factors for Tuberculosis of Residents	$\chi^2=23.99, p=<0.0001$		$\chi^2=31.35, p=<0.0001$	
Grasp	52(66.7)	89(35.9)	70(78.7)	73(42.7)
Not Grasp	24(30.8)	155(62.5)	16(18.0)	91(53.2)
Reasons for Failure to Grasp Tuberculosis Risk Factors of Residents	—		—	
No Perception of the Necessity to Grasp	1(1.3)	6(2.4)	—	1(0.6)
No Idea of Risk Factors	4(5.1)	73(29.4)	1(1.1)	32(18.7)
Busy	10(12.8)	17(6.9)	5(5.6)	10(5.8)
No Idea of How to Grasp	3(3.8)	48(19.4)	—	25(14.6)
Others	7(9.0)	16(6.5)	8(9.0)	15(8.8)
Opportunities of Getting Information about Tuberculosis	$\chi^2=3.12, p=0.078$		$\chi^2=2.69, p=0.101$	
Yes	68(87.2)	192(77.4)	81(91.0)	140(81.9)
No	9(11.5)	50(20.2)	7(7.9)	25(14.6)

by job categories and age are shown in Table. 4.

Most of nurses over the age of 40 are given roles as “chief nurse” in monitoring day-to-day operations of young staff. For this reason, age brackets were divided into “under the age of 39” and “over the age of 40”.

3.3.2.1 Understanding and Knowledge of Tuberculosis

14.1% of nurses (under the age of 39) perceived high risk of catching tuberculosis. On the other hand, only 5.2% of care staff (under the age of 39) perceived high risk of catching tuberculosis.

13.5% of nurses (over the age of 40) perceived high risk of catching tuberculosis. On the other hand, only 8.2% of care staff (over the age of 40) perceived high risk of catching tuberculosis.

37.2% of nurses (under the age of 39) perceived that tuberculosis is not a past disease. On the other hand, low 20.6% of care staff (under the age of 39) perceived that tuberculosis is not a past disease. 58.4% of nurses (over the age of 40) perceived that tuberculosis is not a past disease. On the other hand, low 36.3% of care staff (over the age of 40) perceived that tuberculosis is not a past disease.

12.5% of care staff (under the age of 39) had no idea of at what age one is liable to catch tuberculosis. 11.1% of care staff (over the age of 40) had no idea of at what age one is liable to catch tuberculosis.

10.5% of care staff (under the age of 39) had no idea of whether tuberculosis is a hereditary disease or infectious.

13.3% of care staff (under the age of 39) had no idea of route of tuberculosis infection.

3.3.2.2 Health Management System for Employees

84.6% of nurses (under the age of 39) participated in tuberculosis checkup (chest X-p) every year. On the other hand, low 69.8% of care staff (under the age of 39) participated in tuberculosis checkup (chest X-p) every year.

4.8% of non-participated care staff (under the age of 39) did not realize the value for participating in tuberculosis checkup.

3.3.2.3 Risk Factors for Tuberculosis of the Aged, and Sources of Information about Tuberculosis

Low 35.9% of care staff (under the age of 39) grasped risk factors for tuberculosis of residents.

29.4% of care staff (under the age of 39) had no idea of risk factors and 18.7% of care staff (under the age of 39) had no idea of how to grasp risk factors.

Sources of information about tuberculosis is as follows (Fig. 3): newspaper and magazine (50.1% of the total sample), medical staff such as a doctor at their workplace (47.9%), and TV and radio (38.7%).

3.4 Preventive Education Activities

Our actual performance of preventive education activities for employees in nursing care insurance facilities are as follows: lecture meeting by a specialist in tuberculosis (one time), conferences comprised of members concerned with welfare facilities (2 times), and staff members in our health center giving lectures at facilities on the basis of these data (see Table 5.).

We frame plans to hold lecture meetings in a region, to deliver lectures on tuberculosis by health center staff, and to distribute posters and pamphlets explaining tuberculosis. These sessions have obtained good results (see Table 6.).

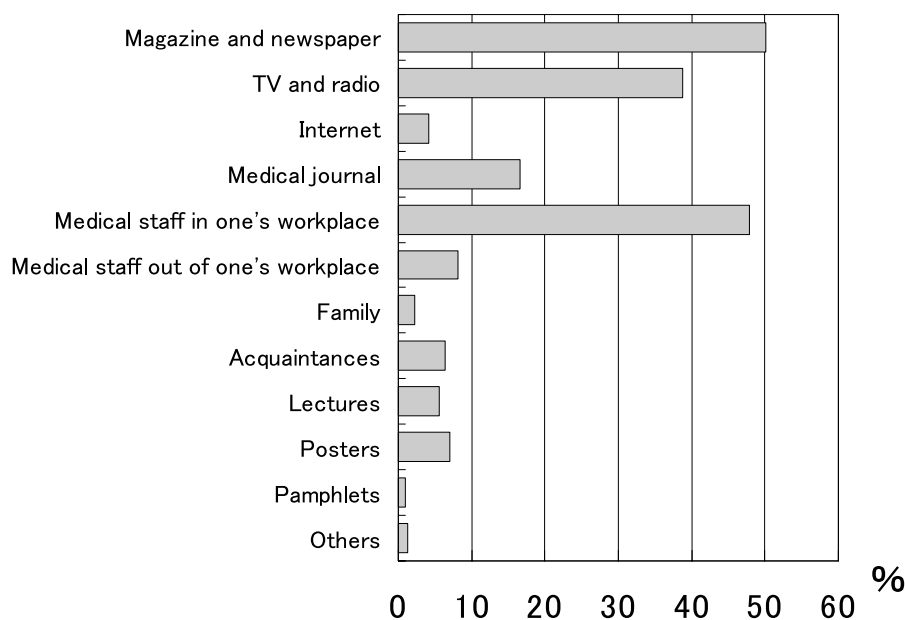


Figure 3 Resources of information about tuberculosis

Table 5 Details of Lectures on Tuberculosis

• The Difference between 'Infection' and 'Onset'
• Complains in Tuberculosis
• Current Situation in Tuberculosis
• Incidence Rate, Prevalence Rate, and the Number of Newly Registered Cases
• Measures against Tuberculosis at Facilities
• Periodical Health Checkup
• Contact Examinations
• Watching Closely Health Status of Residents
• Characteristics of Tuberculosis in the Aged

Table 6 The Fruits of this Project

• Relations between Workers at Facilities and Staff Members of our Health Center Have Grown Closer.
• Workers at Facilities Have Made More Inquires about Tuberculosis.
• Workers at Facilities Have Succeeded in Taking Swift and Proper Measures against Tuberculosis.

4 Discussion

4.1 Health Care for Employees

In Japan, it is difficult to estimate how a strong degree of infection one has newly through a tuberculin skin test, because infants have been made the BCG vaccination decades ago. Therefore, it is proper to introduce 2-step tuberculin skin tests for nurses less than 30 years old, especially on the occasion of tuberculosis medical checkup at employment.

17.3% of new registered tuberculosis cases were detected in periodical medical checkup (2000)³⁾. In Japan the incidence of tuberculosis among nurses are higher compared with these age-matched general population²⁾.

Turning our attention to nurses diagnosed tuberculosis (2002), 38.6% cases were detected in periodical medical checkup and only about 11.8% of these cases were bacteriologically positive (according to Research Projects for Surveillance, Department of Research, the Research Institute of Tuberculosis Japan Anti-Tuberculosis Association). Periodical medical checkup will be a great help for detecting tuberculosis cases in early stages, but it is a fact that the ratio of detected cases to recipients of periodical medical checkup is extremely low. Some cases make rapid progression in two or three months and have a possibility of catching tuberculosis in the intervals of annual medical checkup⁴⁾. Therefore, it is important to put great emphasis on understanding complains of tuberculosis and consulting a doctor early in the appearance of complains in training.

Bacteriologically positive pulmonary tuberculosis cases are the objects of "mandatory hospitalization", but days of hospital treatment has been largely shortened owing to the spread of short course chemotherapy⁴⁾. Bacteriologically negative cases can go to hospital regularly without suspending business (am-

bulatory treatment), because they do not transmit tuberculosis to others. Making a point of this in a health education will be a great help for early consulting a doctor in case of complaining and complying with remedy.

4.2 Health Care System of the Aged in Facilities

The aged in facilities have proved not to receive a sputum examination in periodical health checkup. We emphasize that both chest X-p and mycobacterial examination are essential for diagnosing tuberculosis. It was reported that tuberculosis spread through the whole facility for the aged in Niigata Prefecture. This case is remarkable in the point of "exogenous reinfection"²⁾. It was pointed out that a case, source of infection, had undergone various examinations to investigate causes of repeated cough and sputum over one year, but had not undergone "sputum examination".

Dr.Ahiko, director of Murayama health center in Yamagata Prefecture, stated that we should make much of watching closely health status of residents and conduct sputum examination to detect tuberculosis in an early stage¹⁾ (Ahiko Tadayuki, 2001). At the Tuberculosis Seminar held in Hiroshima city on the 6th February 2002, Dr.Ito, chief of Planning & Medical Doctors Training Division, Department of Programme Support, the Research Institute of Tuberculosis, JATA, stated that it is essential for diagnosing tuberculosis to isolate Mycobacterium tuberculosis from patients' sample through sputum examination, standard methods of examination is direct smear, culture and identification test, nucleic acid amplification test is merely a adjunctive test, culture test is useful for medical monitoring, and diagnosis of relapse is based on detection of Mycobacterium tuberculosis.

It is pointed out that more aged improve general symptoms such as slight fever, fatigue and anorexia than respiratory symptoms such as cough and sputum in case of getting tuberculosis⁴⁾. The risk of getting tuberculosis is increased by diabetes mellitus, stomach excision in the past, cancer, use of adrenocortical hormones, dialysis, pneumoconiosis, previous tuberculosis, and contacts surroundings cases. It is preventive strategies for care staff to understand risk factors of tuberculosis and grasp health status of residents.

4.3 Preventive Education Activities for Employees

In this survey, we contrasted respondents from nurses and these from care staff. Nurses have been educated in medicine and become licensed. We make further study the possibility that business career of nurses might have much impact on perception of tuberculosis.

It is natural that nurses educated in medicine are richer in understanding tuberculosis than care staff. Therefore, we promote on-the-job training for care staff to recognize that the aged are susceptible to getting tuberculosis, to understand tuberculosis correctly, and to watch daily health status of residents closely.

5 Conclusions

We gathered information of health care system and employees' perception of tuberculosis from nursing care insurance facilities by the questionnaire method in the purpose of preventing the spread of tuberculosis. On the basis of the collected data, we delivered lectures on tuberculosis for employees in nursing care insurance facilities. These sessions have done work in care staff taking preventive measures against tuberculosis. Building on these findings, in the next step we intend to

work together with the head of a facility to draw up manuals for preventing tuberculosis infection in a facility.

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