Memorial Lecture by Imamura Award Winner

A PRACTICAL STUDY CONCERNING IMPROVEMENTS TO TUBERCULOSIS CARE PRACTICE

Eriko SHIGETO

Abstract With tuberculosis now relatively well contained in Japan, it is important to reconfigure treatment systems and structures to ensure the most appropriate treatments in the future. A survey of designated tuberculosis treatment facilities in Hiroshima Prefecture revealed declining standards of tuberculosis diagnosis and treatment as well as decreasing knowledge levels in regional areas, suggesting the need for improved collaboration between tuberculosis specialists and regional health care providers. A tuberculosis care pathway designed to promote improved collaboration between referring medical institutions and clinics, and the DOTS (directly observed treatment, short-course) Notebook for patient advice and assistance with compliance, were developed jointly by the Higashihiroshima Medical Center and the Onomichi Medical Association. Following the introduction of tuberculosis care pathway and the DOTS Notebook, we have seen a number of improvements, notably an increase in successful treatment outcomes in regional areas and fewer patients receiving treatment for more than 12 months. These results suggest that better liaison through the regional coordination pathway has led to improved tuberculosis treatment in regional areas. While further refinements and modifications are necessary, it is clear that this represents a step forward in tuberculosis care, and will provide the impetus to bring about meaningful changes to the system.

Key words: Clinical liaison pathway, Community DOTS, Regional coordination, Standards for tuberculosis care

1. Recent changes in tuberculosis care

The number of tuberculosis sufferers has steadily declined over the last few decades, and as a result there are fewer opportunities to undertake tuberculosis care in general medical practice, with treatment increasingly seen as the preserve of specialists. But at the same time, there are fewer tuberculosis beds and fewer tuberculosis specialists, limiting access to treatment, particularly in regional areas. Also, the rapidly aging profile of tuberculosis sufferers means that patients are increasingly likely to require ongoing treatment for conditions other than tuberculosis.

Recent years have seen significant advances in medical treatments for a range of illnesses, and consequently higher expectations with respect to treatment outcomes. When patients have conditions such as psychiatric disorders or renal failure requiring hemodialysis, they might not able to be treated properly in a tuberculosis ward, or have to be transferred to a distant hospital.

Tuberculosis patients are also more likely to require intensive levels of care due to impaired activities of daily living (ADL) at admission or during hospitalization, including ongoing outpatient treatment after discharge or home-based treatment. In some cases, there are no suitable facilities for patients requiring ongoing treatment after discharge, and they end up remaining in hospital for longer than normally be required. For patients discharged to home, the hospital may be too far away for regular outpatient visits.

In light of these developments, it is vital that we work to improve the standard of tuberculosis care in regional areas by setting up regional liaison structures that effectively link tuberculosis specialists with local medical, nursing and welfare facilities, without compromising existing tuberculosis hospital facilities.

2. Current levels of tuberculosis awareness and treatment standards in regional areas

In order to evaluate the standard of tuberculosis care at regional medical institutions, we surveyed 481 designated tuberculosis hospitals within four public health center and subcenter jurisdictions in Hiroshima prefecture, excluding institutions with dedicated tuberculosis wards. Nearly all hospitals in Hiroshima prefecture, irrespective of their listed clinical departments, were found to be designated tuberculosis treating

National Hospital Organization Higashihiroshima Medical Center

Correspondence to : Eriko Shigeto, National Hospital Organization Higashihiroshima Medical Center, 513 Jike, Saijo-cho, Higashihiroshima-shi, Hiroshima 739−0041 Japan.
(E-mail: eshigetou@hiro-hosp.jp)

hospitals. Responses were received from 227 hospitals, comprising 141 general internal medicine departments, nine respiratory medicine departments and 77 surgical or other departments. The results are presented below.

(1) Of the 227 treating physicians at the designated tuberculosis treating hospitals, 48 (21.1%) had treated tuberculosis patients within the previous five years. These comprised 7 of 9 doctors from respiratory medicine departments (77.8%), 39 of 141 from general internal medicine departments (27.7%) and 2 of 77 from other departments (2.6%). Thus, tuberculosis cases were relatively rare at designated tuberculosis treating hospitals, particularly for non-physicians.

(2) Of the remaining 179 clinicians who had not treated any tuberculosis patients in the previous five years, the main reasons were (multiple responses accepted):

- No patients presenting with tuberculosis (66.5%)
- Better to refer them to a specialist (50.0%)
- Lacking the experience or expertise (20.1%)

Also, 14.5% of these 179 clinicians had diagnosed tuberculosis but referred the patient to another hospital due to lack of experience, another 41.9% had referred patients with tuberculosis-like symptoms, and 38.5% had not come across any patients with tuberculosis-like symptoms. There was also a 5.0% don't know/can't recall response.

(3) Of the 37 physicians who had treated tuberculosis patients within the previous five years, 12 (32.4%) had heard of standard treatment and 13 (35.1%) had heard of DOTS.

These results indicate declining rates of tuberculosis treatment in regional areas, with the prevailing trend being to refer tuberculosis cases to specialists. Without action to arrest this trend, we can expect to see a steady decline in the number of physicians able to treat tuberculosis. We also need better sharing of information concerning tuberculosis care, to ensure that those physicians who do offer treatment possess the necessary expertise.

3. Initiatives in regional coordination of tuberculosis care

(1) Background

The Higashihiroshima Medical Center, in conjunction with the Onomichi Medical Association, trialed an initiative to improve regional coordination for tuberculosis care. The process is detailed below.

① The Higashihiroshima Medical Center submitted an application to the Onomichi Medical Association for improved regional coordination in tuberculosis care.

② The Onomichi Medical Association publicized the regional coordination initiative within the local area through information sessions and a survey, and identified the key requirements and expectations for a clinical liaison pathway in the local region.

③ These were used to set up a tuberculosis care pathway for medical professionals as well as a pathway for patients, the directly observed treatment, short-course (DOTS) Notebook. The treatment pathway is designed to be as simple and straightforward as possible, consisting of just two A4 pages. The first page shows treatment start and (scheduled) end dates, medication dosages, methods of administration and a checklist for adverse reactions, together with test timetables and other relevant information, while the second page is used to enter details such as microbiological test results, medications used, and clinical history. Similarly, the procedures that should be undertaken when tuberculosis is diagnosed or suspected are summarized on a two-sided A4 Tuberculosis Care Pathway that can be supplied by the public health center at the patient's request. We also produced a DOTS Notebook, designed to prevent duplication of the separate patient advice and compliance assistance booklets that are currently provided by the hospital at the initial stage and then by the health center after discharge. The DOTS Notebook allows the nursing department of the tuberculosis hospital to coordinate with the health center so that all details of treatment history from start to finish are recorded in the one place.

④ Regional liaison paths were introduced from December 2008 onwards, centered on the Onomichi municipal area. When a patient was discharged from a tuberculosis ward and referred to a regional medical institution, a treatment pathway detailing the tuberculosis treatment schedule was attached to the referral letter. Upon admission to hospital, patients were supplied with a DOTS Notebook for recording information, test results and details of medications administered. Patients were instructed to continue using the DOTS Notebook after leaving hospital and to bring it to outpatient visits. The DOTS Notebook has been translated into English, Indonesian, Tagalog and Chinese for the benefit of non-Japanese patients.

⑤ In parallel with the above, the Tuberculosis Regional Cooperation Study Group was set up to promote evaluation and discussion of tuberculosis care at medical institutions with tuberculosis wards in Hiroshima Prefecture, as well as issues such as whether or not to treat concomitant conditions, how to apportion tuberculosis treatment roles and responsibilities, and the need for formal clinical structures.

⑥ In order to promote regional coordination within Onomichi and throughout the prefecture, a Tuberculosis Care Pathway was featured on the website of the Higashihiroshima Medical Center, while the DOTS Notebook was featured on the website of the Hiroshima Infectious Disease Center, including foreign language translations.

⑦ In 2009, the Hiroshima Prefectural Government set up the Tuberculosis Regional Cooperation Committee comprising representatives of prefectural health centers, the Hiroshima Infectious Disease Center, and hospitals with tuberculosis wards and/or tuberculosis model beds. On behalf of Hiroshima Prefecture, this Committee regularly conducts "Tuberculosis Regional Cooperation Promotion Seminars", that strengthen and act as a surrogate for the above Tuberculosis Regional Cooperation Study Group.

⑧ In 2011, three years after introducing the liaison path-

ways, we evaluated their effectiveness by comparing therapeutic results of initial treatment for positive sputum smear patients in the area covered by the Tobu Health Center (including Onomichi). The findings are shown below.

⑨ Costs associated with holding regular meetings, developing the pathways, and producing the DOTS Notebook (including foreign language translations) were subsidized through a Ministry of Health, Labour and Welfare grant, enabling us to produce a report.

The above constitutes the process by which we sought to improve regional cooperation in tuberculosis care. Fig. 1 illustrates the structure of the liaison network in Hiroshima Prefecture.

(2) Clinical liaison pathway outcomes in Onomichi

We evaluated the benefits of the clinical liaison pathway initiative by analyzing results for tuberculosis patient cohorts in the Tobu Health Center area (which includes Onomichi) in 2006 and 2007 (before introduction of the clinical liaison pathway) and in 2009 and 2010 (using the clinical liaison pathway).

① Treatment was successful (cured＋completed treatment) in sputum acid-fast bacillus smear positive patients in 37.0% of the before group, compared to 53.3% in the after group, as shown in Fig. 2. Of particular note is that the "cured" rate leapt from 0% to 40.0%, while the number of patients still undergoing treatment after 12 months fell from 17.4% to 6.7%.

② Prior to introduction of the clinical liaison pathway, 76.1 % of newly registered tuberculosis patients were initially treated at hospitals with dedicated tuberculosis wards, as shown in Fig. 3. This figure fell to 55.7% following introduction of the clinical liaison pathway, suggesting increased use of general hospitals for the treatment of non-infectious

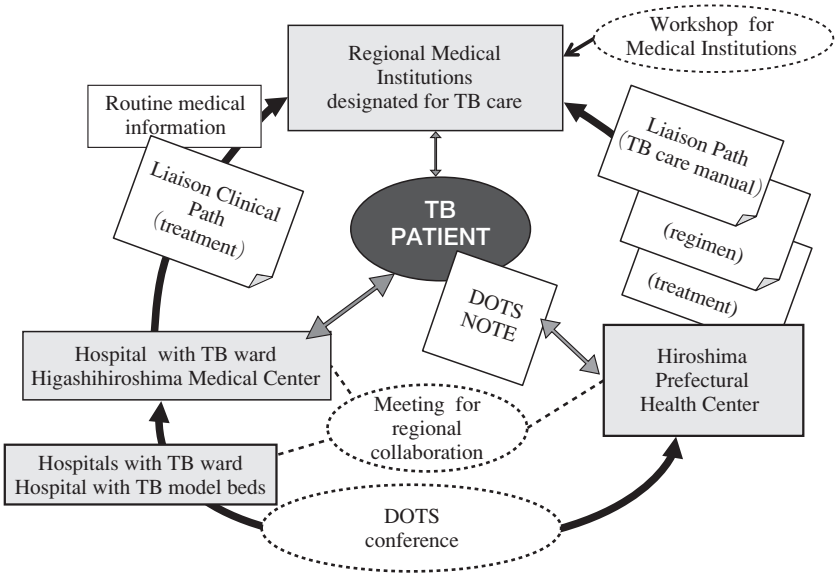

Fig. 1 Regional collaboration for tuberculosis care in Hiroshima Prefecture
Circles with dotted outlines are conducted by the prefectural government.

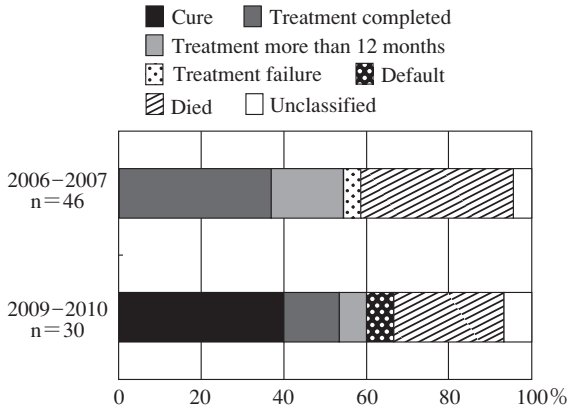

Fig. 2 Treatment outcomes for newly notified sputum smear positive pulmonary tuberculosis patients at the Tobu Health Center before and after introduction of the liaison path

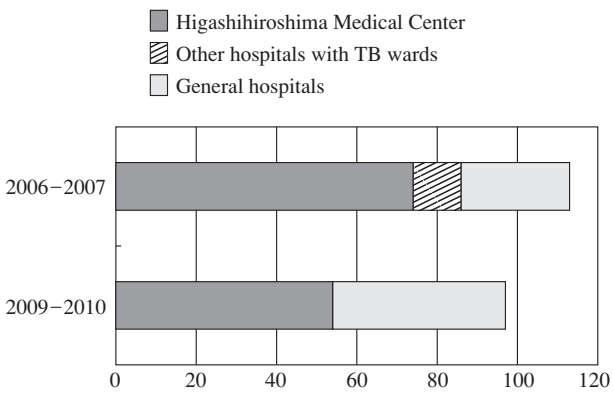

Fig. 3 Where treatment for tuberculosis was commenced for newly notified tuberculosis patients before and after introduction of the liaison pathway to the Tobu Health Center

tuberculosis.

Accordingly, the clinical liaison pathway, by providing information concerning tuberculosis care to regional hospitals, improved treatment outcomes in sputum acid-fast bacillus smear positive patients and enabled more non-infectious patients to commence treatment at their local hospital. In addition to improving treatment outcomes, the clinical liaison pathway helped to promote appropriate medical care while improving patient access to tuberculosis treatment.

When a patient is referred to another institution, the clinical liaison pathway provides the treating physician with comprehensive details of treatment that can be used to design a therapeutic regimen, even if they are not a tuberculosis specialist. The clinical liaison pathway also reduces discrepancies in information given to patients during and after hospitalization. The DOTS Notebook, by maintaining an ongoing record of the therapeutic regimen including medications and dosages, gives patients greater confidence in their local hospital and the continuity of their care.

Standard treatments for tuberculosis are well established. Regional cooperation pathways and clinical pathways, as outlined in this paper, can be used by general medical practitioners to appropriately treat tuberculosis. Specific issues such as drug resistance and adverse reactions can be resolved in consultation with a specialist. Regional cooperation pathways and clinical pathways can also be used as an educational tool for boosting awareness and expertise among doctors in regional areas.

4. Future impact on the provision of appropriate tuberculosis care

Based on the above, in combination with our accumulated experience, it is important to harness the expertise of tuberculosis specialists in improving the standard of tuberculosis care in regional areas. To be genuinely useful to local hospitals, any information provided should be comprehensive but not overly complex, as well as up-to-date and relevant. Regional cooperative pathways are appropriate tools for this purpose.

In addition to these clinical liaison pathways, general hospitals with limited experience in tuberculosis care need to set up close relationships with tuberculosis specialists. Such relationships can be complemented with reference to tuberculosis management guidelines and regional cooperation structures, whereby experienced tuberculosis specialists are available to field queries about treatment issues such as adverse reactions. For instance, hospitals that specialize in tuberculosis treatment could work with public health centers to provide local hospitals with detailed information such as clinical pathways for use when notifying or referring cases. Another example would be setting up a specialist inquiry service.

Patients are increasingly afflicted by a variety of conditions that are increasingly difficult to treat in tuberculosis wards. Major general hospitals in regional areas should ideally provide dedicated wards for patients with airborne infection to enable appropriate tuberculosis care. In these situations, closer liaison with tuberculosis specialists is needed.

Conclusions

Tuberculosis is a major public health issue, classified as a Type II disease under the Infectious Diseases Control Law. Appropriate tuberculosis care requires the development of systems and structures by government. The driving force behind these systems and structures is the design, testing and evaluation of strategies and initiatives to resolve problems encountered in hospitals and public health centers. Evaluation in the hospital environment is critical.

Acknowledgements

The authors would like to acknowledge the generous assistance of officials from the Onomichi Medical Association, public health centers in Hiroshima Prefecture and the staff of a number of facilities involved in tuberculosis care.

References

1) Matsuoka H: Patient-centered tuberculosis treatment and clinical liaison pathways (in Japanese). Kekkaku. 2012 ; 87 : 180.
2) Shigeto E: Development of TB treatment system by liaison critical path (in Japanese). Kekkaku. 2009 ; 84 : 761−766.
3) Shigeto E: Tailoring health care procedures to changes in disease contraction mechanisms — a survey of treatment of complications in tuberculosis wards (in Japanese), "Study of Tuberculosis Treatment Strategies Tailored to Changes in Disease Contraction Mechanisms," Research into New and Re-emergent Infectious Diseases, subsidized by Ministry of Health, Labour and Welfare research grants (lead researcher Nobukatsu Ishikawa) FY2008. Allocated Research Report. 2009, 88−202.
4) Shigeto E: Outcomes for regional liaison and clinical liaison pathways for tuberculosis treatment in Hiroshima prefecture (in Japanese), "Study of Tuberculosis Treatment Strategies Tailored to Changes in Disease Contraction Mechanisms," Research into New and Re-emergent Infectious Diseases such as New Influenza, subsidized by Ministry of Health, Labour and Welfare research grants (lead researcher Nobukatsu Ishikawa) FY2010. Allocated Research Report. 2011, 179−191.
5) Shigeto E: Tailoring health care procedures to changes in disease contraction mechanisms — a survey of treatment of complications in tuberculosis wards (in Japanese), "Study of Tuberculosis Treatment Strategies Tailored to Changes in Disease Contraction Mechanisms," Research into New and Re-emergent Infectious Diseases, subsidized by Ministry of Health, Labour and Welfare research grants (lead researcher Nobukatsu Ishikawa) FY2008−FY2010. General Research Report. 2011, 78−96.