The Japanese Society for Tuberculosis

Tuberculosis Treatment in Japan: Problems and perspectives

—How to expand the Japanese version of DOTS—

JMAJ 52(2): 112–116, 2009

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Tuberculosis Treatment Program in Japan

Modern tuberculosis (TB) control was launched with the enactment of the Tuberculosis Control Law in 1951. In those days, the network of health centers (HCs) was too fragile to deal with the overwhelming burden of TB, which exceeded 700 new cases every year per HC. At the same time, there were too few TB experts. The government therefore decided to establish a unique system to mobilize general practitioners (GPs) in the private sector by law.[1]

Under this system, a GP can treat a TB patient after presenting a treatment plan to the HC that is approved by the HC's advisory board, and in return the treatment fee is subsidized by the government so that the patient has almost no out-of-pocket payments. In this way, the quality of medical practice provided by the GP can be controlled, while the GP can retain his or her clients. The system is also well linked to the national health insurance, and virtually all TB patients to date have been covered by this program.

The Japanese Version of DOTS and Recent Issues in TB Medicine

Since the initiation of TB control as discussed above, the incidence of infection has declined steadily, with the case rate dropping from 698 per 100,000 to 19.8 per 100,000 by 2008, and TB mortality dropped from 110 per 100,000 to 1.7 per 100,000 over the same period. However, it should be remembered that Japan's current case rate is still almost five times that of the USA, and that Japan is categorized as an "intermediate burden country" by the World Health Organization (WHO).[2] Moreover, since 1980 the decline in case and mortality rates has slowed, and during the late 1990s the case rate reversed and went upwards, forcing the government to declare a "Tuberculosis Emergency" and take a series of actions to draw the attention of the general public and relevant organizations to the problem as well as drastically revise the TB control policy.[3] The Research Institute of Tuberculosis (RIT) conducted a joint review of the national TB program, inviting international experts.[4] Enhancement of the treatment program through adoption of the Directly Observed Treatment, Short-course (DOTS) policy was one of the most strongly recommended proposals to emerge from these exercises.

Why was enhancement of the treatment program in Japan requested so forcefully? First of all, it had recently been found that treatment outcomes in Japan were unexpectedly poor. In spite of the HCs' control over the treatment services provided by clinicians, standardized treatment has often been neglected, leading, for example, to irrationally long-term treatments that made the uniform evaluation of treatment outcomes difficult.

The treatment outcomes for homeless patients in several big cities revealed a serious situation (Fig. 1).[5] This is similar to the situation seen in New York before the introduction of DOTS.[6] It was also found that the rate of patients dying

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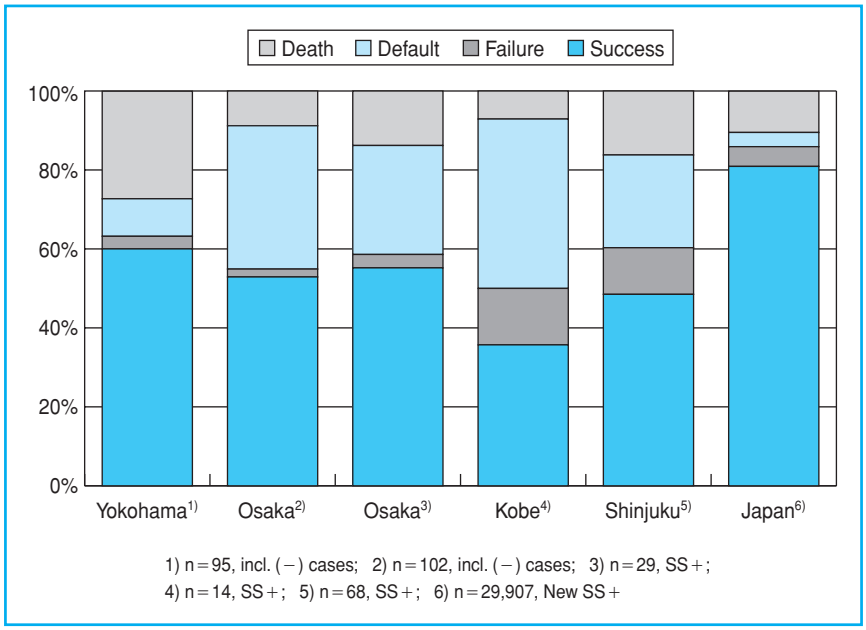

Fig. 1 Treatment outcomes for homeless patients in major cities (Japan, 1995–1997)

within one year of registration gradually increased from 2% in 1987 to 5% in 2006.

These problems have their roots in changes in the epidemiological and socio-economic background of TB patients. Patient ages became higher, with the proportion of patients aged 60 years or older increasing from 18% in 1962 to 62% in 2007. At the same time, more people in older age groups have medical risks predisposing them to TB, such as diabetes. Approximately 13% of TB patients are diabetic. Other risks include malignancy or its treatment, therapy with corticosteroids and TNF-alpha blocking agents.[7]

TB is also concentrated in the urban poor or socio-economic risk population. Among male patients aged 30 to 59 years who are otherwise productive, jobless individuals and those receiving welfare support accounted for 5% of TB patients in 1987 (9% in big cities, 3% in other areas), increasing to 7% in 2007 (10% in big cities, 6% in other areas). One area of Osaka City containing slums has a case rate of 239 per 100,000, which is 13 times the national average (2004).

Problems are also emerging with regard to treatment service providers. Japan's TB treatment used to be dependent on hospital care, be it good or bad, but this has changed remarkably in recent years. Hospital stays are rapidly becoming shorter; the average hospital stay for TB was 318 days in 1975, decreasing to 70.5 in 2006. This inevitably imposes a heavier burden on the ambulatory service and community patient support.

In the health economy, the unprofitability of TB medical services has become more apparent, to the extent that the healthcare community is departing from TB treatment, leading to serious problems such as insufficient beds for TB patients and low clinical capacity levels in some regions.

Concept of the Japanese Version of DOTS

Faced with the situation described above, attempts have been made to introduce the DOTS strategy, which had proven effective in developing as well as industrialized countries,[8] and adapting it to Japanese conditions in order to improve the treatment completion rate of TB patients. Since around 1996, in pockets of several major cities such as Tokyo, Yokohama, and Osaka, there has been a serious TB problem among poor residents (Fig. 1).[5] The DOTS strategy was adopted in the TB hospitals accommodating many of these patients. Hospital nurses showed considerable interest and enthusiasm, and this practice has been expanded to many hospitals across the country.

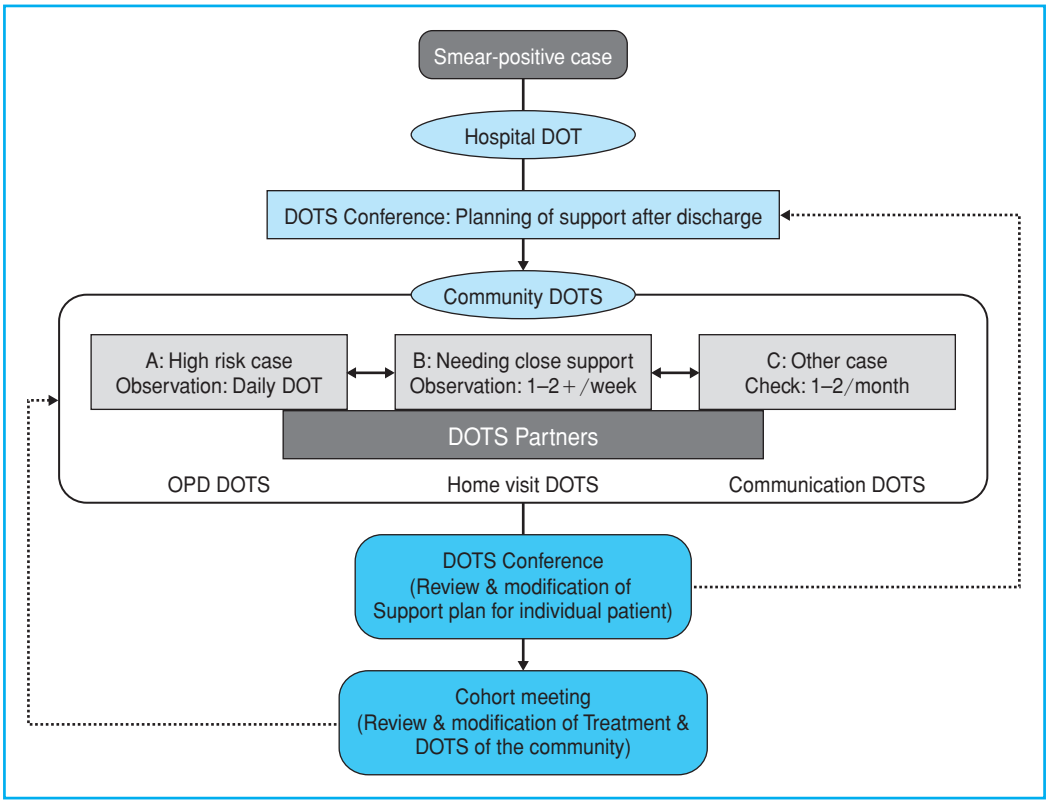

Fig. 2 Japanese version of DOTS

According to a RIT study, by 2002 DOTS was used for inpatients in 89% of hospitals with beds for TB patients.[9] In response to this, the Ministry of Health, Labour and Welfare (MHLW) formulated the so-called Japanese version of DOTS (Fig. 2) as a government-subsidized program to encourage HCs by enhancing community patient support efforts.[10] This was also intended to strengthen liaisoning between hospitals and HCs so that the community could smoothly continue the care of patients discharged after completing treatment under inpatient DOTS.

The program can be summarized as follows. While the patient is still in the hospital, the public health nurse attends a DOTS conference held in the hospital to create an after-discharge support plan for the patient through discussions with hospital staff. After discharge, the HC provides support to the patient, who is categorized in one of three categories depending on the intensity of observation of drug taking required. Type A includes cases such as homeless patients, who are assumed to be at the highest risk of abandoning their treatment and for whom daily observation of drug taking is performed, mostly by asking the patient to come to the HC. Type B includes cases with relatively high risk (such as elderly patients), and frequent home visits (more than one or two times weekly) are made to observe drug taking. Type C includes all other patients, with drug taking confirmed through home visits or telephone calls with the patient or a family member, or through the collection of information from a doctor when the patient makes outpatient visits to a clinic or hospital. Some HCs use the Drug-Taking Booklet in which a record of drug taking is kept by the patient him/herself or a family member, to be checked regularly by a public health nurse or doctor.

This program has support for regular drug taking as its core component, but the cohort meeting and DOTS conference are also very critical for monitoring the progress of treatment. The former evaluates the HC or community activity, and the latter monitors the services for individual patients. Information collection on the

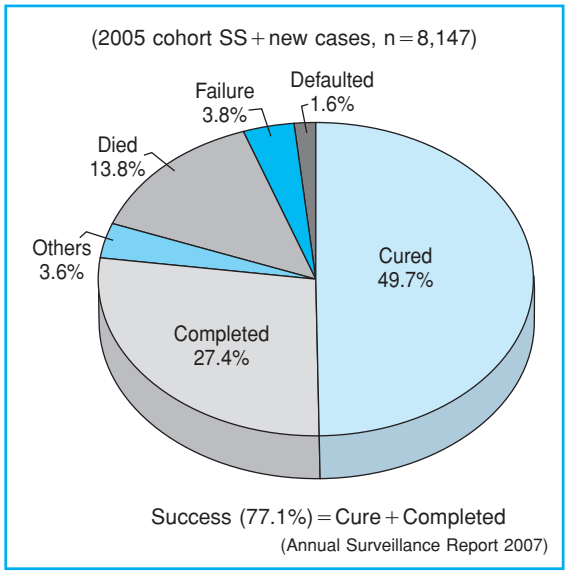

Fig. 3 TB treatment outcomes

progress of treatment (regularity of treatment, laboratory findings, etc.) is also an important role of the HC. The computer system used for TB surveillance was revised to incorporate this information in 2000. In 2007, when the TB Control Law was revised and merged into the Infectious Disease Control Law, the subsidy for this program was abolished because the program became mandatory by law.

Current Status of Implementation

The coverage of community (HC) DOTS, which was initiated slightly later than hospital DOTS, has gradually been expanded. If the proportion of patients whose treatment progress information is reported using a surveillance system in a HC may be taken as an indicator of the DOTS implementation of HCs, implementation has risen from 38% in 2000 to 86% in 2005.[11] Surveys taken by the MHLW revealed that 98% of HCs reported that they practice some form of DOTS, compared with 79% in 2005.[12] However, DOTS conferences and cohort meetings were held in only 73% of HCs in 2007 and 67% in 2005, although these activities should be an integral part of the DOTS program. The distribution of the categories of DOTS was: A for 10.3%, B for 22.5%, and C for 67.1% of patients.

In the same survey,[12] the use of inpatient DOTS was reported by 87% of the hospitals in 2007, compared to 75% in 2005. One problem is that only 46% of hospitals (compared to 31% previously) implement DOTS in their outpatient departments, which means that once the patients are discharged, drug taking support is left to the HCs in many cases. However, it is encouraging that recently the implementation of a new type of DOTS involving observation of drug taking by city pharmacies has increased.[13]

What has the introduction and expansion of this Japanese version of DOTS yielded? Figure 3 shows recent statistics on treatment outcomes obtained by surveillance.[11] (Note that the availability of such statistics itself is an important sign of progress due to DOTS.) The treatment success rate (cure and treatment completed combined) as defined by WHO criteria is not more than 77.1%. The rate for "Failure and defaulter" (5.4%) is not negligible, while the rate for "Dead" (13.8%) is very high.

Apart from treatment outcomes, the adoption of DOTS as the international standard for TB care seems to have promoted medical compliance with the international standards in practice. For example, chemotherapy with a single dosing has been adopted in many hospitals for daily observation of pill taking. Also, the use of a pyrazinamide-containing regimen that used to be unpopular among older physicians has increased from 49% of patients in 1998 to 62% in 2006. The average duration of treatment decreased from 14 months to 10 months during the same period.

Challenges

Though the favorable impact of DOTS expansion on Japan's TB treatment is acknowledged, there is still much to be addressed. Regarding DOTS implementation per se, the evaluation mechanism, involving DOTS conferences and cohort meetings, is not functioning well enough, and it depends too much on Type C, the loosest observation of drug taking, which is closely linked to the scarcity of outpatient DOTS provided by doctors or hospitals. The latter is obviously caused by the lack of economic reward for this labor-intensive service and the low level of remuneration for TB treatment through health insurance in general. Moreover, it should be noted that DOTS is rarely applied to the treatment of latent TB infection at this time.

The high case-fatality rate shown in Fig. 3

implies that the treatment of TB patients requires not only TB chemotherapy but also comprehensive medical care, including specific expertise. To respond to this, beds for TB patients may be needed in general hospitals, which in turn calls for an infection control system with the ward and the staff and a specific level of clinical capacity for treating TB within the hospital. Health-economical considerations should also be taken.

Finally, as mentioned in pages 113–114, the current poor incentives for TB treatment discourage the healthcare community from continuing TB clinical services, thus presenting an urgent challenge for ensuring the quality and quantity of TB treatment. For example, how can we respond to a new issue such as extensively drug-resistant (XDR) TB at the present time?[14] The TB boards of the HCs are generally too weak, and no systematic mechanism for referring such a patient to an appropriate higher level facility is currently functioning. Furthermore, external quality assurance of drug sensitivity testing conducted by commercial laboratories has not yet been introduced.[15]

Conclusion

The introduction and expansion of DOTS appears to have improved the quality of TB treatment in Japan. However, the TB problem as a whole has become increasingly formidable, both medically and socio-economically, and the government and the healthcare community are not addressing this new situation appropriately. Among other things, the central and local governments should be more clearly committed to the scaling up of quality DOTS in terms of economic incentives to hospitals, as well as the staffing and budgets of HCs.

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