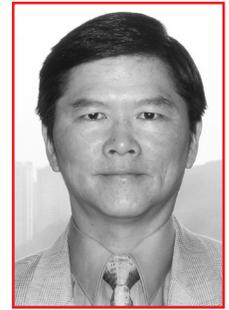




The DOTS Strategy in Hong Kong

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Introduction

Availability of effective drugs and ambulatory chemotherapy in 1950s marked a big step forward in TB treatment. However, the problem of treatment non-adherence soon became apparent, with treatment failure, drug resistance, and spread of infection recognised as serious consequences.¹

In Hong Kong in the 1950s, only about 25% of patients completed treatment.² Supervised treatment under health staff was introduced in 1960s on a trial basis, and later in 1970s, on a service basis. It then became one of the cornerstones of the TB programme, later facilitated by the advent of intermittent and short-course chemotherapy. Since early 1990s, supervised treatment was widely renamed "directly observed treatment (DOT)".³

The global resurgence and DOTS recommendation

In late 1980s and early 1990s, resurgence of TB occurred in various parts of the world alongside drug resistance and HIV co-infection. TB was declared a global emergency in 1993, and it remains an important problem today.^{4,5} Among various control measures, "DOTS" was one of the important strategies strongly advocated.⁶

In early 1990s, "DOTS" was at first an acronym referring to "directly observed treatment, short course". Later, this was broadened to describe the essential, basic methods for diagnosis and treatment of TB. Thus, the DOTS strategy was described as consisting of five principal elements: (i) government commitment; (ii) smear examination in case detection; (iii) regular drug supply; (iv) directly observed treatment (DOT) using short course regime; and (v) regular monitoring and reporting.⁷

For DOTS to be successful, an optimal infrastructure is required, tailored to local needs. Ideally, holistic care is provided, with additional elements like incentives and enablers, often extending beyond the five principal elements.^{8,9} As observations found that adherence cannot be predicted,¹⁰ universal DOT is practised to achieve treatment regularity.

Later, the framework of DOTS was further expanded to incorporate additional elements in controlling drug-

resistant TB: drug susceptibility testing, surveillance of drug resistance, and modification of drug regimen according to susceptibility tests. This was quoted as the "DOTS-plus" strategy.^{11,12}

The DOTS Strategy in Hong Kong

The local TB notification rate is still high, being slightly below 100 per 100,000 population. Hong Kong was classified by WHO as a place of intermediate TB burden with good health infrastructure.¹³

In the Tuberculosis & Chest Service (TB&CS) of the Department of Health, medical services are delivered free of charge (affordable). The chest clinics adopt a walk-in system without the need to make prior appointment for consultation, while DOT is provided at extended times beyond office hours (available). Currently, a total of 19 chest clinics serve different parts of the territory (accessible). Patients can attend any one of them and TB medications are ingested under direct observation of the health staff. A good rapport is established with the patient from the beginning. The "mutualistic" approach is advocated, in which the health care provider and patient discuss and agree to a care plan (acceptable). For patients with physical difficulties, medications may have to be supplied to be taken at home under DOT by community nurses or in elderly homes by institutional staff. Essentially, DOT is practised throughout the treatment course.

Treatment defaulters are traced promptly. A friendly atmosphere is maintained. Reasons for defaulting are explored, help offered, and health education re-emphasised. Other measures are taken where appropriate: referral for social support, use of incentives or enablers, and hospitalisation. Coercive measure is a controversial subject and careful consideration needs to be taken, in particular possibilities of aggravation of social stigma which may adversely affect case finding.

Regarding the element of "reporting system" in the DOTS strategy, a set of "Programme Forms" has been used since 1996, later modified and updated. Information is captured upon treatment, at 6 month, 12 month, and 24 month. Demographics, clinical features, proportion of doses supervised, treatment details and outcomes are recorded. From this dataset, regular cohort evaluation can be performed.

Thus, the local DOTS programme adopts a multi-pronged approach, including education, intermittent



client-focused regimens, incentives, referrals for social support, use of outreach teams and defaulter tracing. Treatment outcomes are regularly reported to WHO and the results are disseminated through the WHO's annual global TB reports. Hong Kong has been classified as a place implementing DOTS with high coverage (>90%, category 4).⁵

Evaluation of the DOTS programme

Evaluation of treatment outcomes based on WHO definitions¹³ was first conducted for the 1996 cohort locally. Among a total of 5757 TB patients, the treatment success rates at 12 and 24 months were 80.4% and 84.8% respectively. Males and patients aged 60 years or older had lower treatment completion rates. Non-adherence, transfer to other services, and mortality among the elderly were key factors influencing treatment outcomes.

WHO has defined a target case detection rate of 70% and treatment success rate of 85%.¹³ The reported rates for Hong Kong and some neighbouring countries are shown in Table 1. While these estimates are based on a number of assumptions and may not be exact, it is clear that much effort is still required to achieve WHO's targets.

There are challenges. Patients' acceptance is not an uncommon problem because of reasons like job factors, geographical inconvenience, physical problems, and human rights claims. Treatment defaulter rate is about 5%.¹⁴ Approximately 41% of these defaulters defaulted within the first 2 months.¹⁴

In a retrospective review among 988 patients, respectively 142, 140, and 21 switched to non-DOT within 2 months, 2 to 6 months, and after 6 months.¹⁵ Analysis showed that patients staying on DOT in the first 2 months had a significantly higher cure rate than those not on DOT (92.7% vs. 83.9%, p=0.002). In another study, analysis of a subgroup with positive pretreatment culture showed that an increase of 10% of DOT during initial phase significantly reduced the risk of relapse by 15.8%.¹⁶ Such observation suggested that non-adherence in self-administered therapy (SAT) may be more common than expected.

Locally, there is a relatively mobile and ageing population with freedom of choice in seeking medical treatment. The doctor who is caring for the TB patient in the early phase of illness plays an important role. Early promotion of knowledge on treatment adherence and DOT would enhance patient acceptance and treatment success.

Notwithstanding the various challenges, local surveillance data during the period from 1986 to 1999 showed that resistance to one or more first-line anti-TB drugs decreased from approximately 17% to 12% for new patients and from 36% to 25% for retreatment patients, while those for multidrug-resistance for new patients and for retreatment patients decreased from 2.7% to 1.0% and from 15.9% to 8.3%, respectively.¹⁷ These findings have been quoted as an example of success of the DOTS strategy.¹⁸

Conclusions

DOTS is one of the cornerstones in TB control. By investing now, a higher cost can be prevented in the future. The local DOTS infrastructure is in place and promotion is through affordability, availability, accessibility, and acceptability. Local medical practitioners will encounter TB cases from time to time. Apart from clinical care, public health measures are also essential. Among these, health education, DOT, monitoring, and ensuring treatment completion are some of the important elements.

Table 1. Case detection and treatment success rates for Hong Kong and some neighbouring countries¹³

Country/ place	2003 cohort			2002 cohort
	Case detection rate (all cases) (%)	Case detection rate (new smear +ve) (%)	DOTS case detection rate (%)	DOTS treatment success rate (as at 12 month) (%)
Mainland China	46	45	43	93
Hong Kong(China)	103 ^a	73	58	79 ^b
Japan	79	60	40	76
Malaysia	61	69	69	76
Republic of Korea	81	59	23	83
Singapore	92	75	44	87

^a Some cases are over-diagnosed or over-detected
^b Over 85% at 24 month)

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