PROBLEMS IN RUNNING A TUBERCULOSIS DISPENSARY IN A DEVELOPING COUNTRY: TURKEY

Gelişmekte Olan Bir Ülkede, Türkiye’de Bir Tüberküloz Dispanserinin İşleyişindeki Sorunlar


ÖZET


Bu sonuçlar, verem sağsal dispanser hizmetlerinin iyi kullanılmadığı göstermiş ve birçoğu izleyen değişiklikleri önemseme yöntemcisidir: (1) Kitle taraması için kullanılan ekonomik kaynakların daha iyi anaclar için kullanıma ayrılması; (2) tüberküloz için ayrı bir sistem, sağlık hizmetinin bütünlüğünde kopmalar getirici ve dengelayıcı etkide olduğundan, verem sağsal dispanserlerinin yerel, genel ve üniversite hastanelerini ile fonksiyonel bütünlüğünün kurulması; (3) Yetersiz izlemle ilişkin soruların azaltılması için tüm hastaların ve temaslardan bir bilgisayar veri tabanına kaydedilmesi.

Tüberkülozddaki artışın önlenmesi için, Türkiye gibi gelişmekte olan ülkelerde, mevcut kontrol programlarının gözden geçirilmesi ve geliştirilmesi gerektiğini düşündüyöruz.
Problems in running a tuberculosis dispensary in a developing country: Turkey

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Summary — Declining use of the services of local dispensaries has often been suggested as a
significant factor in the rising trend of tuberculosis in Turkey after 1970. Data confirming this view
were insufficient until this study, which consists of an evaluation of the records of 51,088 subjects
seen by the tuberculosis dispensary in Elazig between 1995-1989. We found that, despite an
expected yearly population increase, there were no significant differences in the numbers of
diagnostic and follow-up procedures as well as preventive and therapeutic interventions recorded
in different years, and that cases of active tuberculosis lost to follow-up had gradually increased.
The least effective method of case-finding, mass screening, had been employed most frequently.

These results revealed a less than optimum use of the services of the tuberculosis dispensary
and prompted us to suggest the following changes: (1) diversion of economic resources currently
used for mass screening in order to use them for better purposes; (2) functional integration of
tuberculosis dispensary with local, general or university hospitals, since a separate system
for tuberculosis care is accompanied by a segregating and stigmatising effect for all concerned;
(3) entrusting all patients and contacts into a computerised database to alleviate the problems
associated with inadequate follow-up.

We conclude that existing control programmes should be reviewed and improved to prevent an
increase of tuberculosis, particularly in developing countries like Turkey.

Introduction.

The significant decrease in tuberculosis in developed countries [1, 2] has led to changes in control strategies [3, 4], with a resultant loss of activity of local tuberculosis services. The situation is quite different in developing countries, which generally have disease rates 10-100 times that of developed ones and a trend of increasing rather than decreasing tuberculosis as has been observed in Turkey, where a control programme based on the construction of dispensaries after the foundation of the Republic in 1923 resulted in an initial decline of the disease followed by its resurgence in the last 2 decades [5-8].

The first important step in the struggle against tuberculosis in Turkey was the establishment of two voluntary organisations and a dispensary in 1923 [5, 6]. Voluntary organisations increased rapidly and united to become the National Society for Tuberculosis Fight in 1948 and a member of the International Union Against Tuberculosis in 1949 [5, 6]. It is only
fair to note that, in many parts of Turkey, dispensaries built by the National Society for Tuberculosis Fight and/or the Ministry of Health were the first institutions to provide modern diagnostic and therapeutic measures, not only to patients with tuberculosis but to all of the population in their locality. The number of dispensaries reached 256 by 1980 (2). They were planned to be institutions with primary responsibility for performing BCG vaccination, tuberculin testing, radiological and bacteriological screening, finding new cases of infection and/or disease; providing anti-tuberculosis drugs on an outpatient basis for prevention or treatment; referring patients to sanatoriums if indicated; reporting their follow-up to the Tuberculosis Fight Administration (a division of the Ministry of Health), and to other dispensaries if they transferred care; evaluating and observing their contacts; determining the frequency of, and mortality related to, tuberculosis in their area. Each dispensary works in cooperation with a local branch of the National Society for Tuberculosis Fight to cover the expenses of the above services and to provide financial support to patients. Dispensaries were, and still are, the only institutions that carry health services directly to the homes of patients by the periodic follow-up calls of health visitors and that deliver all types of aid to patients in an organized and regular manner under the close supervision of the Ministry of Health. Therefore, their contribution to the struggle against tuberculosis has never been regarded as questionable, despite the lack of controlled studies revealing a definite cause-effect relationship. There are some observations suggesting their beneficial influence on tuberculosis control. A decrease in the number of subjects evaluated by dispensaries after 1967 was followed by an increase in their reports of new cases after 1978 to reach a mean incidence of 38 per 100,000 population in 1983 (range: 24–126 per 100,000) in different age groups, being highest in the 20–24 age group (3, 6, 9).

In 1950, the law concerning health care provision in the Republic was passed, which ordered the notification of all cases of, and deaths from, tuberculosis to the Ministry of Health and outlined the punitive measures to be used in the event of its violation, but the latter have had no effect in practice due to the lack of a refined system for the regulation of physician practices. Actually, almost all statistics pertaining to tuberculosis in Turkey are still derived from the reports of tuberculosis dispensaries. This was not as problematical as it is now in the early years of the Republic, when dispensaries were among the very few health care providers in their localities; in the interim, the vast increase in the number of official and private health care units has made it almost impossible to delineate the dimensions of the problem. Indeed, the proportion of patients with tuberculosis as diagnosed by dispensaries is a current topic of discussion. The only study with a scientifically acceptable design performed with respect to this subject was conducted both in 1981–1982 (5) by members of the Tuberculosis Fight Administration, in cooperation with members of the Large Diseases Department of Ankara University Faculty of Medicine on 80,000 subjects, who were selected randomly from 8 different geographical regions to obtain a nationally representative sample and were screened by means of a questionnaire for symptoms and personal history, performing a physical examination and chest radiography in all, and evaluating the spectrum of those that could give a sample by direct microscopy and culture. Since tuberculosis of organs other than the lung is rare in Turkey (6), disease rates found during this study were accepted as approximate prevalence rates. Thus, a mean prevalence rate of 3.58 per 1000 population was estimated, with a minimum of 1.86 per 1000 in West Anatolia, increasing gradually in the Southern Anatolian, Central Anatolian, Mediterranean, Eastern Anatolian, Thrace and Black Sea regions (in that order) to reach 7.34 per 1000 in South East Anatolia (5). 31.3% of the cases found during the study were not located in dispensary regions (5, 6). Even more disturbing is the fact that the cause and complications of such patients outside the dispensary system is absolutely unknown. Although none of the dispensary services mentioned above entail any change to the subjects concerned, their use has been frequently described as being less than expected (5–8); this could contribute to the recent increase of tuberculosis. The purpose of this study, which is a retrospective evaluation of the activities of the main dispensary in Elazığ, Turkey, was to assess the validity of the above view by searching for indicators of deteriorating function of the dispensary model. We present our findings with the hope that they may have relevance for the improvement of tuberculosis control programmes in other developing countries.

Patients and methods

Elazığ is a province located in East Anatolia, which, after South East Anatolia, is considered to be the second least developed among the 8 main geographical regions of Turkey (10). Like many other provinces, Elazığ witnessed a rapid population increase after the Second World War (11). The relative proportion of urban population rose from 16.13% in 1927 to 48.30%
in 1985 [11], implying increasing urbanisation but not at a rate comparable to some other provinces of Turkey [12]; this protected Elazığ to a great extent from the emergence of slums. The illiteracy ratio of people aged 6 and above in Elazığ decreased from 90.85% in 1935 (84.47% in men and 97.00% in women) to 34.39% in 1985 (37.09% in men and 44.31% in women) [11]. Traditionally, Elazığ was not an important site of immigration from places other than its own districts, and emigration from elsewhere to cities and countries was also quite rare, but recent changes in this area have begun to encourage immigration from other regions including South East Anatolia [13, 14]. Elazığ is one of the provinces granted priority in government funding since 1968 [15]; it has resulted in some important advances such as the construction of irrigation channels, energy plants and various industrial plants, leading to socioeconomic progress. Admittedly, none of the above figures concerning development stand anywhere near those of industrialised countries, but they are quite similar to many provinces of Turkey [12] and can be crudely summarised as representative of a moderately developed province. Eastern Anatolia is a region with a prevalence of tuberculosis ranking fourth in line among 8 regions. Therefore, we considered that data concerning the situation of tuberculosis control in Elazığ could be extrapolated to most of the country. Although there are two tuberculosis dispensaries in Elazığ, one is situated in Pili, a small district with a population comprising only 6.6% and 6.2% of the total population of the province in 1985 and 1990 respectively [16], the rest of the inhabitants are served by the main dispensary located in the centre of the province.

In this study, the files of a total of 51,786 subjects evaluated at the main tuberculosis dispensary of Elazığ between 1985–1989 were reviewed in order to determine the number and results of various procedures used for the prevention, diagnosis, treatment and follow-up of the disease; data pertaining to different years were compared with each other. Over 5 years, 1511 cases of active, and 1237 cases of inactive, tuberculosis had been diagnosed; but further inspection of their records revealed various diagnostic errors in 254 of them, corrected numbers for active and inactive cases were 1250 and 1527 respectively. As used in dispensary records, an ‘active’ case indicates a patient with radiological and/ or bacteriological evidence (a positive sputum and/or culture result of the examination of any relevant sample, generally sputum) of ongoing disease in need of treatment, an ‘inactive’ case is a patient with a history and/or radiological findings of healed tuberculosis with negative bacteriological results. ’Organised mass screening’ is the periodic and systematic screening of selected population groups, such as the candidates of various educational institutions and of military service as well as tradesmen and laborers.

One of the major purposes of this study was to compare the actual numbers of all cases of tuberculosis listed in dispensary records with predicted val-

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**Fig. 1** Changes in the number of people subjected to organised, voluntary or contact screening by the tuberculosis dispensary in Elazığ, Turkey between 1985–1989.
Tuberculosis Diagnosis

was, which were calculated as follows: the results of the general census of 1985 revealed a population of 485,713 for that year and an annual increase in the rate of 18.57 per 1000 between 1980-1985 in Blagaj and provided estimations for the mid-year population figures of 1986, 1987, 1988 and 1989, compiled by the State Institute of Statistics using a standard formula (P = P_0 e^{rt}) [11]. The population estimated for 1988 was 527,873 and very near the actual figure of 537,712 found in the census conducted that year [16], indicating that the estimates for 1985-1988 were not exaggerated. However, we did not do a retrograde population projection based on the results of the 1990 census, because they are still being processed and the State Institute of Statistics has warned that they will possibly be subject to changes [15]. The yearly numbers of cases of tuberculosis in Blagaj were predicted by using these population estimates and the prior observation of a prevalence rate of 3.73 per 1000 in Eastern Amur, determined during the 1981-1982 study detailed above [5]. To avoid confusion, we ignored the fact that there was another dispensary in Blagaj, since the population under its supervision is very small in comparison to the main dispensary.

Table 1 Population figures and numbers of cases of tuberculosis in Blagaj, Bosnia, in consecutive years

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>All registered cases of tuberculosis*</th>
<th>Predicted no.</th>
<th>Observed no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>485,713</td>
<td>1,904</td>
<td>572</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>527,873</td>
<td>1,938</td>
<td>663</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>592,000</td>
<td>2,165</td>
<td>675</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>658,500</td>
<td>2,285</td>
<td>715</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>715,100</td>
<td>2,113</td>
<td>765</td>
<td></td>
</tr>
</tbody>
</table>

Population values consist of the actual for 1985 and the predicted numbers for the other years (see text for the prediction method of population figures and numbers of cases). *P = 0.001 for differences between observed and predicted values (chi-square test).

The demographic characteristics, methods employed for diagnosis, spacial results and outcomes of 1320 cases of active tuberculosis were entered into a computerized database (Microsoft Works Productivity Software Inc., USA) allowing record selection and determination of frequency distribution according to different variables. Data were analysed statistically with Student's t and chi-square tests and analysis of variance as indicated (software: StatView™ and StatView 512+™, BrainPower Inc™, USA). A p value less than 0.05 was considered to be significant. Graphs pertaining to the data were obtained by using the Excel package (Microsoft Corp., USA). Plus-minus values denote the mean ± standard error of the mean.

Results

When the total of 51,086 subjects seen by the dispensary between 1985-1989 were analysed, approximately 60% were found to have been seen as a result of organised mass screening, 30%, due to voluntary presentation because of symptoms or for check-up (voluntary screening); 5% due to contact screening and less than 2% as a result of transfer-in. Between 1985 and 1989, a total of 50,149 and 26,853 and 2,677 subjects had been evaluated as a result of organised, voluntary and contact screening, respectively; the numbers of cases with active tuberculosis found by these methods were 22, 1051 and 182 respectively. The diagnostic yield of various types of screening were not different in separate years, with a mean value of 7.98% for contact, 6.14% for voluntary and only 0.301% for organised screening. There were no noteworthy differences in the distribution of cases of active tuberculosis according to their reasons of evaluation in 3 years, with 71.9-90.4% being registered as active after voluntary screening and 7.1-20.2% after contact screening; the contributions of organised screening and transfer-in to case finding were negligible. Voluntary and contact screening had not been performed with increasing frequency over the 3 years, but organised screening had (Fig. 1).

Differences between the observed and predicted yearly numbers of all cases of tuberculosis were significant, as presented in Table 1 and depicted graphically in Figure 2.

The mean age and male/female ratio of cases with active tuberculosis in different years ranged between 22.2 ± 0.3-30.1 ± 0 years and 1.77-1.91, respectively, and did not show an appreciable change in the period studied; there were no statistically relevant changes in their distribution according to age (Fig. 2) or sex in 5 consecutive years.

Despite a steady annual population increase, no important variations were found in the numbers of BCG vaccinations, tuberculin tests, chest radiographs and home visits undertaken by the dispensary in different years. Similarly, there were no noteworthy differences in the number of subjects receiving preventive isoniazid treatment in any year. The main treatment protocols of the dispensary consisted of combinations of rifampin + isoniazid + pyrazinamide + ethambutol or streptomycin for 2 months, followed by rifampin + isoniazid or ethambutol) in a total period of 9 or
12 months, with adjustments made according to anti-microbial resistance results; no statistically relevant differences were noted in their associated cure and recurrence rates during a mean patient follow-up time of 2 ± 0.3 years (data not available for all).

The lung and lymph nodes were the main sites involved with disease in the 1320 patients with active tuberculosis as shown in Table 2. Analysis of their sputum results revealed that there were more patients who had not submitted sputum, or whose direct microscopy and/or culture result was negative or un-
Table 2: Percentage distribution of cases with active tuberculosis according to the site of involvement in 5 consecutive years.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Lung (initial phase)</td>
<td>91.7</td>
<td>92.1</td>
<td>91.9</td>
<td>91.8</td>
<td>91.7</td>
</tr>
<tr>
<td>Extrapulmonary tuberculosis</td>
<td>0.6</td>
<td>0.7</td>
<td>2.3</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Lymph nodes</td>
<td>0.0</td>
<td>0.5</td>
<td>0.6</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Meninges</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Pericardium</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Bone</td>
<td>0.0</td>
<td>0.0</td>
<td>2.3</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Others</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

P < 0.05 for differences between years.

Discussion

The incidence of tuberculosis has been increasing in Turkey since the early 1970s, beginning pronounced after 1978 [3-8]. Tuberculosis dispensaries contributed significantly to the success achieved in the control of the disease in the early years of the Republic [3-8]. Turkish laws require the notification of all cases of tuberculosis to the Ministry of Health to ensure their treatment as well as the evaluation of therapy and protection of their contacts by the dispensary in their locality. Unfortunately, many problems are inherent in this system, since physicians other than pulmonary specialists may see patients and often neglect to report them. This leaves dispensaries almost on their own in finding new cases. The former efficacy of the dispensary system could have been due to the very few health centres available to patients in the past; such centres have increased rapidly in recent years. Declining use of the services of tuberculosis dispensaries, perhaps caused by decreasing notification, has often been considered as an important factor contributing to the rise of tuberculosis in Turkey [3-8], but data confirming this suspicion were lacking until this study. We found that, despite an expected yearly population increase in Istanbul, there were no significant differences in the numbers of diagnostic and follow-up procedures as well as preventive and therapeutic interventions undertaken by the dispensary in 5 consecutive years. This could not be attributed to a decreasing rate of tuberculosis in our area, since the mean age of the patients with active...
The disease was quite young, with no noteworthy change in 5 years. Spatium results indicated poor patient compliance in sample procurement rather than a varying pattern of disease, since the lung was the main site involved in all years. Patients with active tuberculosis who were lost to follow-up had increased whereas those successfully treated had decreased over 5 years. Although the mean patient follow-up time was insufficient to permit definite conclusions, there did not seem to be important variations in the results of follow-up treatment protocols, implying that case-finding was more important for the control of tuberculosis than the type of treatment.

The predominance of male patients over females has been noted by others as well [19] and could be due to differing susceptibility, but it could have been the result of the increased presentation of men, which is a problem encountered in developing countries with the relatively lower socioeconomic status of women leading to their dependence on male family members for obtaining medical care. The fatality rate among women in Elazig is still regrettably high, adding strength to this suspicion.

Of particular interest was the disparity between the frequency of methods employed to find cases of tuberculosis which were organised races, voluntary and contact screening, decreasing in that order, and the relative merit of these methods with respect to leading to a diagnosis of active disease, which increased exactly in the same order. The latter observation is in line with the reasoning of Sutherland [14], who concluded that general population screening was an unproductive method of case-finding.

The results summarised above leave no doubt as to the declining and less than optimum use of the services of the main tuberculosis dispensary in Elazig, Turkey. Based on our observations, we are in favor of three changes in the practices of dispensaries to increase their efficiency:

1. There is sound reason to continue mass screening, since its diagnostic yield is very low. Diversion of economic resources from mass screening would enable them to be used for increased drug delivery and financial support to patients and contacts as well as for programme development and research.
2. A separate system for the prevention, diagnosis, and treatment of tuberculosis is favored by an inherent segregating, stigmatising and, therefore, disturbing effect for all concerned, as reflected by the impressive increase in the number of patients lost to follow-up over 5 years. The latter could be due in part to rapid changes in the composition of the population, since transpiration is indeed a very important problem in developing countries, as pointed out by Stelbo [18]. But the records of interviews made with the relatives of defaulting patients revealed that even they were reluctant to have any sort of contact with the dispensary. These observations are not surprising, since the isolation of patients with tuberculosis has been unsuccessful in other countries as well.
To quote the special report of the New York City Tuberculosis Committee [19], describing the situation in America in the past, "...Sanitariums became a supplement to general hospitals, not an alternative... patients developed effective strategies for avoiding the facilities. In fact, the ability of patients to circumvent official policies was one of the most important lessons to emerge from the sanatorium experience...sanitariums...did isolate residents and make recovery into society more difficult...". Following a similar line of thought, we believe that tuberculosis dispensaries are not an effective alternative to, and should become a functionally integrated part of, local general, or, preferably, university hospitals, with patient referrals from dispensaries to hospitals to permit the use of refined and rapid diagnostic procedures. Reverse referrals would also be necessary, whereby patients with a definite diagnosis of tuberculosis would be sent from hospitals to dispensaries for drug delivery without charge and for contact screening. A simple change of the name of the tuberculosis dispensary to imply that it had become a division of the local hospital, specializing in chest diseases, could prevent the discontinuance of presentation to the dispensary and could also facilitate the finding of lung and heart diseases other than tuberculosis. Such a reorganization would obviously have its associated problems in the beginning, but we do not see any reason to protest on the present system since its falling efficiency is confirmed by the lack of correlation between the numbers of cases of tuberculosis that we predicted and the actual numbers found by the dispensary. Our predictions can not be considered as being exaggerated, since the population estimates that they were based on were not too. The data presented indicate that insufficient notification of cases to dispensaries remains an important obstacle in tuberculosis control in Turkey. The use of scientific methods to delineate the magnitude of the problem can be expected to press medical communities to review their tuberculosis policies, including their attitudes toward notification, if any. We agree with Pia [20] that "...the possibility of accelerating tuberculosis control will be enhanced by building up the basic tuberculosis program...". In other words, an improved, rather than an oversimplified programme is needed to obtain success in tuberculosis control, particularly in developing countries. It is hoped that the results of this study will provide the stimuli for further research into the subject and for other collaborative efforts between dispensaries and local hospitals.

(3) Inadequate patient follow-up is an important aspect of the failure of the dispensary model and a better method for reporting and recording subjects is necessary. Entering all patients and contacts into computerized databases in dispensaries or at least in the Ministry of Health could be of considerable help, since patients changing site of accommodation could be traced easily, repeated entries could be avoided, defaults, complications, and tuberculosis contacts could be determined and corrected rapidly. The initiation of this database would, of course, add to the cost of the tuberculosis programme, but would probably be cost-effective eventually, since it could lead to a decrease in the excess morbidity and mortality currently related to uncontrolled tuberculosis. A similar approach has been employed in Turkey for another disease, leprosy, by Aybekin and Seylan [21] and has facilitated patient follow-up. In fact, initiating a single database in the Ministry of Health would perhaps be even more advantageous with respect to reaching a definition of the overall problem, since the very scarce data concerning patients with tuberculosis seen by other state health care providers are reported to that ministry. This seems difficult at present, but will possibly be realised in the future as the number of health care providers with computerized data retrieval systems increases.

Of course, factors other than the declining use of dispensary services, such as the high rates of population growth and mobility, inflation and unemployment after the early 1980s as well as problems continuing since the founding of the Republic, such as inadequate education, rapid and unplanned urbanization accompanied by the appearance of overcrowded slums with poor sanitation, must have contributed to the recent increase in tuberculosis in Turkey [2, 10, 12-15]. On the other hand, it is tempting to speculate that at least some of the effects of such adverse conditions could have been counteracted by dispensaries through their charge-free delivery of medical and pharmaceutical aid, had patients with tuberculosis and/or their contacts been aware of the means of, or had not feared presenting to, dispensaries. The locally observed increase of tuberculosis in Turkey has been followed by a decreasing enthusiasm for BCG, presumably to permit an assessment of the annual infection risk of unvaccinated subjects. Although the last approach is suitable for developed countries with extremely low disease rates, we do not think it would be wise to adopt it in the face of a dangerously increasing prevalence of tuberculosis; in fact, a low vaccination rate could be still another factor preventing control of the disease.

We conclude that the falling efficiency of the dispensary model is an important problem for Turkey and
that Smyth [18] was definitely right in stating that "... the principal reason for failure of tuberculosis control programs in developing countries is obvious: we are unable to diagnose a sufficient amount of sources of infection... more importantly, we are unable to care those who are diagnosed.

Acknowledgement

This study was inspired by the沿着 of a beloved teacher, the late Dr. Cahit Altun, former director of the Tubercolisiye Binası, who devoted a lifetime to tuberculosis control in Turkey. The authors are grateful for all that he taught them and dedicate this article to his memory.

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