Can hospitalization provide better compliance in smear positive tuberculosis patients?

Ahmet Levent KARASULU, Sedat ALTIN, Levent DALAR, Sinem Nedime SÖKÜCÜ, Pınar ÖZKAN

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ÖZET

Hastane yatışı yayma pozitif akciğer tüberkülozu hastalarda kompliyansı artırır mı?

Çalışmanın amacı; akciğer tüberkülozu hastaneye yatış ile tedavi başarısının ilişkisini araştırmaktır. Hastanede yatmış insan immünyetmezlik virüsü (HIV) negatif, yayma pozitif 351 pulmoner tüberküloz olgusu çalışıldı. Tüm hastalar Dünya Sağlık Örgütü (DSÖ) kategori 1’e dahildi. Kronik ek hastalığı olan ve tedavide komplikasyon gelişiren hastalar çalışmadan çıkarıldı. Bölge dispanserinden takipli olan 306 hasta kontrol grubu olarak çalışmaya alındı. Gruplar tedavi nin altıncı ayında tedaviye uyumları açısından değerlendirildi. Ortalama yaş 37.48 ± 13.87 idi; 204 (%31.1) hasta kadındı. Yatan hastalarda ortalamı yatış süresi 25.4 ± 14.2 gündü. Toplamda 304 (%86.6) hastaneye yatış hasta tedavisini tamamlarken, geriye kalan 47 (%13.4) olgu takipten çıktı. Hastanede yatış süresi ile tedavinin tamamlanması arasında ilişki gözlenmedi (p> 0.05); 295 (%96.4) ayaktan hasta tedavisini başarıyla tamamladı. Tedaviyi tamamlamama olasılığı yatan hastalarda anlamlı olarak yüksekti (RR: 3.72 %95 GA: 1.96-7.05 p< 0.05). Sonuçlar göstermiştir ki; ek hastalığı olmayan kategori 1 hastalara tedavinin hastanede yatarak başlanmasını tedavi sonucunu olumsuz olarak etkilediği tedaviyi tamamlayanların yüzdelerine bakılarak söylenebilir.

Anahtar Kelimeler: Tüberküloz, hastane yatışı, uyum.

SUMMARY

Can hospitalization provide better compliance in smear positive tuberculosis patients?

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The aim of the study was to explore the relation between hospitalization and the success of therapy in lung tuberculosis. Three hundred and fifty one hospitalized human immunodeficiency virus (HIV) negative, smear positive cases of pulmonary tuberculosis were studied. All cases were World Health Organization (WHO) category 1 patients. The patients with chronic additional disease and those who developed complication during therapy were excluded. Three hundred and six outpatients attending to local dispensaries were also included as control group. The groups were compared with respect to completion rates at 6 months of therapy. The average age was 37.48 ± 13.87 years; 204 patients were women (31.1%). For inpatients, mean hospital stay was 25.4 ± 14.2 days. A total of 304 (86.6%) hospitalized patients completed their treatment; the remaining 47 (13.4%) cases were not followed-up. No significant relation was observed between the length of hospital stay and completion of therapy (p > 0.05); 295 (96.4%) outpatients successfully completed their treatment. The probability of not completing the therapy was significantly higher for hospitalized patients (RR: 3.72 95% CI: 1.96-7.05 p < 0.05). Our results show that in category 1 patients without concomitant disorders, initiation of treatment at hospital has an adverse influence on the outcome of treatment, as reflected by the percentage of completers.

Key Words: Tuberculosis, hospitalization, compliance.
Following patient groups were excluded from the study: those who were followed up in another city than Istanbul (n= 1140); patients with unreliable medical records (n= 613), patients with diabetes mellitus (n= 228), chronic renal disease (n= 143), or chronic liver disease (n= 148); patients suffering from malnutrition (n= 92); homeless patients (n= 25); patients suffering from serious side effects due to medication (n= 193); patients who had been re-hospitalized due to serious haemoptysis during therapy (n= 20) [these are the patients for whom hospitalization was recommended in American Thorax Society/Centers for Disease Control and Prevention (ATS/CDC) guidelines]. For the remaining 351 cases, the data obtained from local dispenseries were checked against the data obtained from national center. The completion status at 6 months therapy was stated.

A total of 306 age and sex matched outpatients attending to local dispensaries during the same period were also included as controls.

The 2 groups were compared with respect to completion rates at 6 months of therapy. The relationship between the length of hospitalisation and the completion of 6 months of therapy was explored.

**Statistical Analysis**

All data were analysed by SPSS 10.01 (Statistical Package for Social Science). Student t-test was used to compare the difference of length of hospitalization between the patients who completed the treatment and those who could not be followed and mean age difference between two groups. The relationship between the length of hospitalization (numerical value) and completion rate at 6 months of therapy was evaluated by student-t test. Chi-square test was used to evaluate the success of inpatient and outpatient treatment strategies. A p value less than 0.05 was considered statistically significant.

**RESULTS**

The average age was 37.48 ± 13.87 years (range 13 to 84 years); 204 (31.1%) patients were women, and 453 (68.9%) were men. The mean age of hospitalized patients was 38.4 ± 13.9 years (range 13 to 84). The mean age of outpatients was 34.8 ± 13.9 (range 12 to 61). The two groups were similar with respect to age and gender distribution (student t-test p > 0.05).

For inpatients, mean hospital stay was 25.4 ± 14.2 days (range 6 to 89 days). A total of 304 (86.6%) hospitalized patients completed their treatment; the remaining 47 (13.4%) cases were not followed-up (Figure 1).

No significant relation was observed between the length of hospital stay and completion of therapy (25.04 ± 13.6 and 27.96 ± 17.5, p > 0.05) (Table 1); 295 (96.4%) outpatients successfully completed their treatment, while 11 (3.6%) cases could not be followed. The probability of not completing the therapy was significantly higher for hospitalized patients (RR: 3.72 95% CI: 1.96-7.05 p < 0.05).

**DISCUSSION**

Although international health organizations such as WHO and IUATLD widely recommend and endorse implementation of DOTS with its proven cost-efficacy and success, in Turkey, where there is a relatively long history of tuberculosis endemic, the treatment is initiated at the hospital in 74% of patients regardless of referral status (9). Although chronic diseases, drug resistance, treatment failure, non-compliance to treatment, compromised health status, advanced disease or frequent episodes of haemoptysis,
uncontrolled or insulin dependent diabetes mellitus, chronic kidney or liver disease, drug allergy, adverse effects requiring hospitalization, coexistent illnesses that require hospitalization, conditions that preclude outpatient treatment, requirement for definite diagnosis, and being homeless were among the qualification criteria for hospitalization as stated by the central health authorities, this trend continues to exist.

On the other hand, as Ozkara et al. reported in their study, availability of DOTS and bacteriological diagnostic techniques at hospitals as well as the opportunity to recognise cases who are less likely to comply with treatment are among the assertions used to support this strategy (10). The most important concern with regard to following patients in their own social environment is the risk of conveying the disease to other members of family. The landmark Madras study and the subsequent studies have clearly shown that there is no difference with respect to infection risk at home between outpatients inpatients and that the rate and percentage of improvement and the risk of recurrence are similar in these groups of patients (11,12).

Our study shows that in a large and densely populated urban area like Istanbul with its remarkable socio-cultural diversity and population dynamics, the completion rate was higher in outpatients with similar demographics compared to those patients who were hospitalized.

Given the fact that there is no comprehensive DOTS administration in our region, and patients get their full-month pill supply at one visit to a local dispensary and use them at home, and no bacteriological examination is performed at the end of the therapy, which is a prerequisite to determine the cure, it is clear that complete analysis would be an insufficient measure. Despite this, the difference is striking.

Of the hospitalized patients, 13.4% were lost to follow-up, which represents a higher percentage compared to national average (9.2%) at the same time period (9). On the other hand, the fact that the corresponding figure was only 3.6% in the outpatient group points out to the adverse influence of hospitalization on compliance to therapy. The causes of this adverse influence need to be examined in further studies. However, it does not necessarily mean that the patients who could not be followed, have not ever completed their treatment. It is possible that they might have completed their treatment without dispensary follow-up in somewhere which is out of national records such as in a private doctor office etc. This issue might be a limitation of our study.

The longest hospital stay in our series was 89 days. The probability of achieving a negative culture result is 90% and the risk of recurrence is significantly reduced in a patient who has been hospitalised for 89 days, for whom DOTS should have been administered at least during the hospital stay. The total cost of the treatment regime consisting of 2 months of HRZS and 4 months of HR is 266 USD for outpatients, whereas the daily cost of inpatient treatment was 32 USD, as of August 2004, among 100 patients randomly selected from our hospital database, representing 2620 days of hospitalization. Since average length of stay in hospital was 25 days, the average cost is 800 USD only for hospitalization, and this value rises to 2560 USD for a 80-day stay in the hospital, reaching 10 fold of the cost of cure perpatient with DOTS. Thus, failure to fully implement one of these two strategies is the most important potential risk for Turkey and similar countries. These two strategies are either implementing a comprehensive DOTS control programme based on local units or diminishing the emphasis on local services by hospitalising all patients, therefore ignoring all economical disadvantages and inflicting an outdated management approach, as in the era of sanatorium. A dispute between the two approaches increases the risk of failure. A well-organised primary care system is essential in our fight against tuber-

### Table 1. Mean hospitalization stay of patients completed and uncompleted treatment in both groups.

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<tr>
<th></th>
<th>Mean ± SD</th>
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<tr>
<td>Successful</td>
<td>25.04 ± 13.6</td>
<td>7-87</td>
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<tr>
<td>Unsuccessful</td>
<td>27.96 ± 17.5</td>
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culosis. As shown in our study, substitution of primary health services in secondary centers and even in referral centers like ours inevitably results in a decline in our success rates; in other words, our quality of care decreases and the cost of treatment increases. On the other hand, DOTS is less expensive and more effective compared to traditional treatment strategies (1,13).

One of the controversial points of our study is that we compared patients which are followed up only for 6 months of therapy. It is obvious that we cannot be sure that the patients who are not followed up or who moved to another city completed the therapy or not.

Actually this is the point that this study want to discuss and point to. In our countries control program there are breaks between layers of our health system. And this affects the tuberculosis control program unfavorably. From this aspect we believe all recorded cases must be compared. In the study why some patients were not followed up is clearly defined. On the other hand, fifth of the five elements of the DOTS is the cohort analysis and this becomes impossible due to these breaks between layers (14).

One of the widespread ideas in our country is that the hospitalization in the initial phase increases the treatment coherence and by this way decreases development of MDR patients. On the other hand in ATS/CDC guides hospitalization was recommended only for non-adherent patients. It was also, openly mentioned that fort he prevention of development of chronic patient the most important strategy is widen of DOTS. In the same guide the sources consumed for hospitalization can be spend for the education of the personel which takes part in DOTS and widespread DOTS.

Our results show that in category 1 patients without concomitant disorders, initiation of treatment at hospital has an adverse influence on the outcome of treatment, as reflected by the percentage of completers. Thus, establishment of a nation-wide DOTS service is a strict requirement for an efficient tuberculosis control programme.

REFERENCES