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By Dr. Sampa Mitra

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Keywords: referral, DOTS, RNTCP, RG Kar Medical College, chi-square test.

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Evaluation of 'Referral for Treatment' System under RNTCP in a Hospital at Kolkata, India

Dr. Sampa Mitra

Abstract- To handle the problem of tuberculosis (TB), Government of India started the Revised National TB Control Programme (RNTCP) in 1993, whereby Directly Observed Treatment, Short-course (DOTS) was officially adopted as the strategy in 1997. The medical colleges, involved in the RNTCP programme, refer the patients to the DOTS centres near their homes, after assigning the treatment categories. This study attempts to evaluate this 'referral for treatment' system during the second phase of RNTCP (RNTCP-II). To achieve this objective, pertinent data regarding 758 patients referred from RG Kar Medical College, Kolkata, to various DOTS centres in West Bengal, between 01.10.2006 and 30.09.2007, were collected from the said medical college, the relevant DOTS centres, the patients themselves, using a suitable questionnaire, and also the family members and the neighbours of some patients. Chi-square test at 5% level of significance was used as an analysis tool. The study displays some serious drawbacks in the system of 'referral for treatment' in West Bengal viz., non-registration at the DOTS centre after referral, inadequacy of previous TB treatment method (indicating the shortcomings in the referral system going on since 2003), regarding which, the urban-rural divide is significant, low conversion rate from sputum positive to sputum negative patients after 2-3 months of treatment, and possibility of unfavourable outcome (which includes death) following treatment, which is significantly dependent on the type of patient, i.e., whether seriously ill or not. Besides, this work shows a high prevalence of TB in the productive age group i.e., 15-44 years.

Keywords: referral, DOTS, RNTCP, RG Kar Medical College, chi-square test.

I. Introduction

To tackle the heavy burden of tuberculosis (TB) and improve the quality of treatment, Government of India, in 1993, revitalized its National TB Programme (NTP) as Revised National TB Control Programme (RNTCP). In 1997, Directly Observed Treatment, Short-course (DOTS) was officially adopted as the strategy of RNTCP. By the end of 2005, the whole of India was covered under this programme (i.e., RNTCP). During the second phase of RNTCP i.e., RNTCP-II, which was started in 2006, there was an improvement in the quality and reach of service.

Since 2003, the medical colleges have been involved in the RNTCP programme. Here, the treatment categories are assigned to the patients, after diagnosis. Next, they are referred to DOTS centres situated within short distances from their residences. There, the actual treatment is done. This is the system of 'referral for treatment'.

The objective of this paper is to judge how the technique of 'referral for treatment' worked under RNTCP-II.

To achieve this objective, this study was conducted between 01.09.2007 and 31.08.2008, on the TB patients referred from RG Kar Medical College to various DOTS centres in West Bengal (India).

Before undertaking the study, a brief literature survey was performed, but no work dealing with the appraisal of the system of 'referral for treatment' in West Bengal, was found.

II. Methodology

In this work, the details regarding the 758 patients (the study population), referred from this college between 01.10.2006 and 30.09.2007, were recorded. The referrals had been classified into two categories viz., inside district (i.e., DOTS centres inside the Kolkata (metropolis) district), and outside district (i.e., DOTS centres outside Kolkata). The data regarding the fate of patients, after their referrals, were also collected. To understand whether there is a significant association between the area of referral and the registration status (at the DOTS centre), between the area of referral and the disease status, between the area of referral and the conversion status of new sputum positive cases, and between the type of patient and the outcome of the treatment after referral, the chi-square tests were done at 5% level of significance, in all the cases. The formula for chi-square (χ^2) is given by equation (1):

$$\chi^2 = \sum \frac{(O-E)^2}{E} \qquad (1)$$

where,

O = each observed value in any one of tables- 2 to 5,

E = each expected value in the same table = (row total X column total / grand total) corresponding to each value in that table,

p = p-value (calculated using relevant software system) corresponding to the chi-square value with 1 degree of freedom.

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If $p < 0.05$, then it can be concluded that the relevant association is significant; otherwise, it (i.e., the pertinent association) is not significant.

The outline of the method, used in this study, is depicted in figure-1.

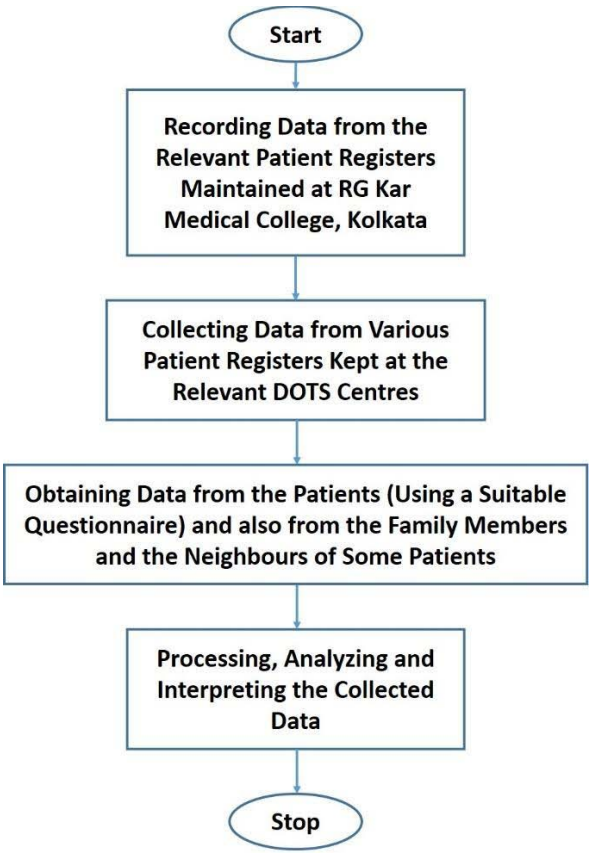


Fig.-1: Pictorial representation of the outline of the method

III. Results and Discussions

Table-1 gives a preliminary idea about the study population (i.e., the referred patients) on the basis of age and gender.

Table-1: Distribution of the study population according to age and gender

Age (years)	Referrals inside district		Referrals outside district		Total
	Male	Female	Male	Female	
15-44	73	100	184	135	492
Other	48	36	126	56	266
Total	121	136	310	191	758

It may be noted here that 15-44 years pertains to the productive age group; hence, it has been highlighted in table-1. It is really a matter of concern that the total number of referrals was much higher for this age group, than for the other groups (as per table-1). Also, table-1 shows that the number of females, referred to DOTS centres inside the district, was more than that of the males, whereas higher number of males, as compared to females, were referred to DOTS centres outside the district.

Table-2 shows how many of the referred patients actually registered in the DOTS centres after referral.

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Table-2: Distribution of the study population according to the registration status

Registration status	Area of referral		Total
	Inside district	Outside district	
Registered	224	439	663
Not registered	33	62	95
Total	257	501	758

It can be seen from table-2 that a considerable number of patients (95 among 758 i.e., nearly 13%) did not register in the DOTS centre for treatment after referral; this is a cause of worry. Also, it may be noted that the number of non-registered patients at DOTS centres located outside district (i.e., outside the metropolis of Kolkata) is nearly double that for DOTS centres located inside district (i.e., within Kolkata). However, the chi-square test shows that the association between the area of referral and the registration status is not significant at 5% level (p-value=0.85286>0.05; degree of freedom=1). Thus, though there is no significant urban-rural divide in case of registration at the DOTS centres, the relevant authorities should urgently devise ways to urge all the referred patients to register at the DOTS centres; otherwise the problem of TB cannot be handled efficiently.

Table-3 displays how many of the referred patients were newly infected with TB, and how many were infected with TB before, but had come for treatment again, as the previous treatment was unsuccessful.

Table-3: Distribution of the study population according to disease status

Area of referral	Disease status		Total
	New case	Retreatment case	
Inside district	204	53	257
Outside district	435	66	501
Total	639	119	758

It is clear from table-3 that quite a large number of patients (119 among 758 i.e., nearly 16%) had come for retreatment due to inadequacy of previous treatment method. This is really a cause of concern. Also, this fact indicates the shortcomings of the 'referral for treatment' system going on since 2003. Further, the chi-square test shows that the association between the area of referral and the disease status is significant at 5% level (p-value=0.00738<0.05; degree of freedom=1). It shows that there is a significant urban-rural divide with respect to the adequacy/success of previous TB treatment technique. The pertinent authorities should see that new TB patients get adequate treatment so that, in future, there will be no need for retreating previously treated TB patients. Also, they should ascertain that there is no urban-rural divide with regard to adequacy of TB treatment.

Table-4 depicts how many of the new sputum positive TB patients (who registered in the DOTS centres after referral) were converted into sputum negative patients after 2-3 months of treatment.

Table-4: Distribution of the new sputum positive registered patients according to conversion status

Area of referral	Conversion status			
	Conversion of new sputum +ve cases after 2-3 months (A)	No conversion of new sputum +ve cases after 2-3 months	Total new sputum +ve cases (B)	Conversion rate (%) [AX100/B]
Inside district	60	34	94	64
Outside district	78	28	106	74
Total	138	62	200	69

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It is evident from table-4 that the number of sputum positive patients who were not converted into sputum negative ones in 2-3 months, is substantial (62 among 200 i.e., 31%). The reason for this should be investigated. However, the chi-square test shows that the association between the area of referral and the conversion status is not significant at 5% level (p-value=0.13333>0.05; degree of freedom=1). Thus, there is no significant urban-rural divide in case of conversion of sputum positive patients; rather the conversion rate is better for patients attending DOTS centres outside Kolkata, than for the ones attached to DOTS centres within Kolkata. Anyway, competent authorities should find out ways to ensure 100% or near 100% conversion rate after 2-3 months of treatment, instead of 69%, as shown in table-4.

Table-5 presents how many of the patients who registered at the DOTS centres, got positive/favourable result after treatment. In this table, (i.e., table-5), "favourable outcome" implies any one of the following:

- the patient was cured, and
- the patient's treatment was completed, but it was not ascertained whether the patient was ultimately cured or not (i.e., -ve sputum was found at the end of initial phase of treatment, but sputum was not tested at the end of the final phase),

and "unfavourable outcome" indicates any one of the following:

- the patient died during treatment, irrespective of the cause,
- the patient defaulted (i.e., at any time after registration, the patient did not continue the treatment for 2 months or more consecutively),
- the patient was transferred to another area, and
- the patient's treatment failed (i.e., +ve sputum was found after ≥5 months of treatment), but the patient was not dead (when the data were collected).

Table-5: Distribution of registered patients according to outcome of treatment

Type of patient	Outcome of treatment		Total
	Favourable outcome	Unfavourable outcome	
Seriously ill (categories- I and II)	416	76	492
Not seriously ill (category-III)	167	3	170
Total	583	79	662

Table-5 indicates that the number of patients for whom the outcome of the treatment was unfavourable (unfavourable outcome includes death, as already indicated), is considerable (79 among 662 i.e., nearly 12%). This matter needs urgent attention of the pertinent authorities. Moreover, the chi-square test shows that the association between the type of patient (seriously ill/not seriously ill) and the outcome of treatment is significant at 5% level (p-value=0.00001<0.05; degree of freedom=1). This is also a cause of worry.

It may be mentioned here that in table-5, patients with category-I treatment regimen are the new sputum positive pulmonary TB cases, the new sputum negative pulmonary TB cases, who are seriously ill, the new cases of extra-pulmonary tuberculosis, who are seriously ill, and all the new TB cases with known HIV positive status (Central TB Division (under Directorate General of Health Services of Government of India) 2005). Patients with category-II treatment regimen, in table-5, are the sputum positive relapse cases, the sputum positive failure cases, the sputum positive default cases currently under treatment, and the others i.e., extrapulmonary relapse or failure cases (Central TB Division (under Directorate General of Health Services of Government of India) 2005). And, in the same table, i.e., table-5, the patients with category-III treatment regimen are the new sputum negative pulmonary TB cases, who are not seriously ill, and the new extra-pulmonary TB cases, who are not seriously ill (Central TB Division (under Directorate General of Health Services of Government of India) 2005).

Further, in table-5, the total number of registered patients is shown as 662, while it is mentioned as 663 in table-2. Actually, for one of these 663 registered patients, the mode of treatment was other than DOTS; hence, the outcome of treatment he/she received is not relevant to this study, and his/her case has not been included in table-5.

Thus, this study shows that there are certain serious lacunae in the system of 'referral for treatment' in West Bengal, which should be urgently looked into. These are:

- the problem of not registering at the DOTS centre after referral,
- the problem of inadequacy of previous TB treatment method (indicating the drawbacks of the 'referral for treatment' system (which includes the drug treatment) going on since 2003), and the urban-rural divide with regard to this,
- the problem of low rate of conversion from sputum positive to sputum negative patients after 2-3 months of treatment, and

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- the problem of unfavourable outcome (which includes death) following treatment, and its dependence on the type of patient (i.e., whether he is seriously ill or not).

Further, this study indicates a high prevalence of TB among the patients of productive age group viz., 15-44 years; this matter also needs urgent attention.

Before concluding this section, it will be prudent to have a quick look at the findings of some of the other researchers working in this field.

Kondapaka et al. found that among the patients admitted to Government General and Chest Hospital, Hyderabad (India), between 1st January, 2010 and 30th June, 2010, for treatment of TB, 921 were ultimately referred to peripheral centres, but formal feedback was received for only 682 of them, indicating deficiencies in the system of referral for treatment and feedback (Kondapaka et al. 2012). Bharaswadkar et al. studied the role of Private Practitioners (PPs) in RNTCP in Pune (India) in 2010, and observed that though many PPs worked as referral centres, a considerable number of them were not adhering to the standard international guidelines for the treatment of TB (Bharaswadkar et al. 2014). Jayabal et al. noted that for a considerable number of TB patients, referred within and outside the Chennai district (India) by some Tuberculosis Units of Chennai Municipal Corporation, between January 1, 2014 and June 30, 2014, either no further information was available or treatment was not initiated (Jayabal et al. 2017). Thomas et al. conducted research, in 2015-16, on some TB patients of Chennai (India) who stopped following up the treatment process either during diagnosis, or at the time of referral/hospital admission, or when the official RNTCP registration process was to be done, and discussed various possible reasons for this behaviour of the patients (Thomas et al. 2020). Stalin et al. devised an intervention package to reduce the number of those TB patients of the Puducherry district (India), who were referred for treatment by four medical colleges in the district, but for whom no feedback was available (Stalin et al. 2020). They (i.e., Stalin and his group) observed that before using the package, the percentage of such patients was 54 (in the 3rd and the 4th quarters of 2016), and after applying the package, it became 34 (in the 2nd quarter of 2017) (Stalin et al. 2020). Arora et al. found that among the 4395 TB patients, handled by Maulana Azad Medical College, Delhi (India), and its associated hospitals, between July 2018 and March 2019, 3315 were referred out, but feedback was received for only 797 of them (Arora et al. 2021).

Thus, these studies point out the drawbacks in the system of 'referral for treatment', in various parts of India, other than West Bengal.

IV. Conclusions

This study evaluated the system of 'referral for treatment' in West Bengal, in 2007-08, and found certain serious shortcomings in this technique, with regard to percentage of registration at DOTS centre, adequacy of previous TB treatment method (which gives an idea about the performance of the 'referral for treatment' system going on since 2003), rate of conversion from sputum positive to sputum negative patients after 2-3 months of treatment, and chance of overall positive result following treatment.

Also, this work shows a high occurrence of TB among the patients of productive age group i.e., 15-44 years.

A more comprehensive study needs to be done to judge the strengths and the weaknesses of not only the system of 'referral for treatment' but also the RNTCP programme, considering the fact that the problem of TB in India should be handled effectively and urgently. This task may be taken up in future, if possible.

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References Références Referencias

1. Arora R, Khanna A, Sharma N, et al (2021) Early Implementation Challenges in Electronic Referral and Feedback Mechanism for Patients with Tuberculosis Using Nikshay -- A Mixed-Methods Study from a Medical College TB Referral Unit of Delhi, India. J Fam Med Prim Care 10: 1678–1686.
2. Bharaswadkar S, Kanchar A, Thakur N, et al (2014) Tuberculosis Management Practices of Private Practitioners in Pune Municipal Corporation, India. PLoS One 9:
3. Central TB Division (under Directorate General of Health Services of Government of India) (2005)

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Module for Multi-Purpose Workers and Other DOT Providers. New Delhi.
4. Jayabal L, Frederick A, Mehendale S, Banurekha V (2017) Indicators to Ensure Treatment Initiation of All Diagnosed Sputum Positive Pulmonary Tuberculosis Patients Under Tuberculosis Control Programme in India. Indian J Community Med 42: 238–241.
5. Kondapaka KK, Prasad SV, Satyanarayana S, et al (2012) Are Tuberculosis Patients in a Tertiary Care Hospital in Hyderabad, India Being Managed According to National Guidelines? PLoS One 7:
6. Stalin P, Manikandan M, Antony V, et al (2020) Identifying and Addressing Factors Contributing to Pretreatment Loss to Follow-Up of Tuberculosis Patients Referred for Treatment from Medical Colleges in Pondicherry: An Implementation Research. Indian J Community Med 45: 27–31.
7. Thomas BE, Suresh C, Lavanya J, et al (2020) Understanding Pretreatment Loss to Follow-Up of Tuberculosis Patients: An Explanatory Qualitative Study in Chennai, India. BMJ Glob Heal 5:

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