Comprehensiveness of primary services in the care of infectious tuberculosis patients in Rawalpindi, Pakistan

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Setting: All tuberculosis (TB) diagnostic centres of Rawalpindi District, Pakistan, including five tertiary care hospitals and 16 rural health centres.

Objective: To identify among sputum smear-positive patients registered during 2009 in the laboratory register those who had not been recorded in a treatment register, defined in the study as 'initial loss to follow-up'.

Design: A retrospective record review of routine TB data.

Results: There were 16145 suspects screened for TB and recorded in the laboratory registers. Of 1698 smear-positive patients identified in the laboratory registers, 101 (6%) could not be identified in the treatment registers. Eighty-six (10%) of 842 patients in tertiary care hospitals and 15/856 (2%) in rural health centres were not recorded (OR 6.4, 95%CI 3.6–11.6, $P < 0.01$).

Conclusion: The study shows a significant association between type of health facility and initial loss to follow-up. In rural health centres, the proportion lost to follow-up is low, reflecting more efficient care than in tertiary care hospitals. Strategies are urgently needed to improve the registration and follow-up of smear-positive cases in tertiary care institutions.

Control, treatment and prevention of tuberculosis (TB) are dependent on ensuring that all infectious patients who are diagnosed initiate and complete treatment. This requires a health system that functions efficiently at all levels. National Tuberculosis Programme (NTP) guidelines in Pakistan stipulate that each TB patient found to be sputum smear-positive should be registered in the laboratory and then entered into a patient treatment register and followed up until treatment is completed. Previous studies indicate that some smear-positive patients may be identified in the laboratory but never initiate treatment.^{1–3} Patients who are not enrolled on treatment present three main challenges: if they are not promptly recorded they may be difficult to trace and may spread infection in the community, they compromise the efficiency of care and compromise prevention of TB in their districts, and they lead to false estimates of treatment success.⁴

In Pakistan, tertiary care hospitals have recently been engaged to provide TB services. As these hospitals face a huge workload with human resource constraints, we expected that loss to follow-up of smear-positive patients might be more frequent. Previous studies have reported on the predictors of default at later stages during treatment, but less emphasis has been placed on evaluating loss to follow-up of smear-positive patients prior to treatment initiation.

The aim of the present study was to compare tertiary care hospitals and peripheral diagnostic centres with respect to the proportion of patients classified as 'initial loss to follow-up'. This information is needed to guide policy to improve the efficiency of TB care. No study on this subject with this particular comparison has previously been reported from Pakistan.

METHODS

Design

The study was a retrospective record review of routine TB data.

Setting

The study was conducted in Rawalpindi District of Punjab Province (population 4.5 million) in Pakistan, a district chosen because of a high estimated initial default rate in 2009. The study was carried out in all diagnostic centres in the public sector, which included 16 rural health centres and five tertiary care hospitals. The data collected included the whole year of 2009. Data collection was undertaken from September 2010 to March 2011.

According to the NTP guidelines, 'suspects' are identified at the general out-patient department, based on their symptoms, and then sent to the laboratory for sputum smear examination using routine microscopy. At all facilities, both rural health centres and hospitals, patients are requested to provide two sputum specimens, one to be examined on the spot and the other brought to the laboratory the following morning. The results of sputum smear examination are recorded in a laboratory register and patients found to be smear-positive should be referred to the out-patient clinic where treatment is to be provided and recorded in the patient treatment register.

Study population

We defined 'initial loss to follow-up' as those smear-positive patients found in the laboratory register who could not be identified in a treatment register anywhere in the district.

The study population included all smear-positive TB patients whose residential address was in the district, regardless of age or sex, who were entered in the laboratory register at any of the facilities participating in the study. Those with addresses outside the district were excluded, as it was difficult to trace such cases and they might have led to over- or underestimation of initial default and bias. All those recorded as smear-positive were traced by name in the treatment register

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KEY WORDS

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of the facility. Any patient not found in the treatment register was recorded in a data collection tool. All patients on this list were then traced in the treatment registers of all the other treatment centres of the district and, if found in these treatment registers, were no longer classified as 'initial loss to follow-up'.

Data collection and validation

The data collection tool was piloted prior to the study. The principal determinant of the study was the type of health facility (rural health centre or tertiary care hospital), and the outcome variable was the patient labelled 'initial loss to follow-up'. Additional information collected included age, sex and address (complete address, including street address) to assess distance from the health facility. A search of registers in the entire district was undertaken to identify duplicate registration, and was continued for 3 months (one calendar quarter) after the close of the study period to ensure that patients who were subsequently recorded were not missed.

Analysis strategy

We estimated a required sample size of 725 sputum-positive patients in each group (tertiary and peripheral hospitals) to achieve a power of 80% based on an estimated rate of 'initial loss to follow-up' of 15% at tertiary hospitals, intending to detect a 33% lower rate in peripheral facilities. Variables were examined by their frequency distributions, displayed in contingency tables and the comparisons tested for significance. A probability of 5% was considered statistically significant. From the contingency tables, the χ^2 , odds ratios (ORs) and their respective 95% confidence intervals (CIs) were calculated.

Ethics approval

The study protocol was approved by the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease (The Union), Paris, France, and the National Ethics Advisory Board, Bridge Consultants Foundation, Karachi.

RESULTS

A total of 16145 suspects were screened for TB and recorded in the district laboratory registers: 9711 in tertiary care hospitals and 6434 in rural health centres. A total of 1698 patients (10% of suspects registered) were found to be smear-positive, significantly more in rural health centres ($n = 856$, 13%) than in tertiary care hospitals ($n = 842$, 9%; OR 1.62, 95%CI 1.46–1.79, $P < 0.01$).

Among the smear-positive patients recorded in the laboratory registers, 101 (6%) could not be identified in the treatment registers (tertiary care hospitals 86, 10% vs. rural health centres 15, 2%; Table). The difference was statistically significant (OR 6.4, 95%CI 3.6–11.6, $P < 0.01$). The frequency of initial loss to follow-up increased with advancing age ($P < 0.01$, χ^2 test for trend). Associations with other variables, such as sex and distance from health facility, were not found to be statistically significant. A lower proportion of smear-positive patients were missing from rural health centre registers than from tertiary care hospitals, whatever distance they lived from the facility.

DISCUSSION

This large study showed that more than one in 20 infectious TB patients was not registered on treatment in this highly populated district of Pakistan. The proportion of cases initially lost to follow-up was lower than reported in many other studies from around the world.^{1–3,5–8} The remarkably low rate in rural health centres

TABLE Characteristics of smear-positive tuberculosis patients and the association with initial loss to follow-up, Rawalpindi District, Pakistan, 2009

Patient characteristics	All cases	Lost to follow-up		P value
		n	%	
Total	1698	101	6	
Age group, years				
0–24	851	29	3	<0.01
25–44	474	39	8	
≥45	373	32	9	
Sex				
Male	972	57	6	0.43
Female	726	44	6	
Distance from home to facility, km				
<5	561	30	5	0.71
5–50	569	37	6	
>50	568	34	6	
Type of facility				
Tertiary care	842	86	10	<0.01
Rural health centre	856	15	2	

might be explained by better access to care, which facilitates proper follow-up of patients, and the possibility that health workers are able to give more time to counselling and supporting patients in rural health centres, as recommended in the NTP guidelines. The higher rate of initial loss to follow-up in the tertiary care hospitals could be explained by the higher workload, human resource constraints, poor access to services for patients, inappropriate knowledge, attitude and practice of physicians working in the public sector tertiary health facilities and lack of coordination with the primary care cadre.^{9,10}

The study has provided new knowledge, as no such comparison of initial loss to follow-up has previously been reported from this type of health facility in Pakistan. A major strength of this study is the very large sample of patients, and we believe it may be representative of the situation in the rest of the country.

A study from Nazimabad Chest Clinic, Karachi, reported that 62/224 (28%) patients in the laboratory register had not been entered into the treatment register.¹¹ The most common reason for this was 'dissatisfaction with services at the clinic'. However, this study was limited in that it was confined to only one specialised clinic.

The results of the study demonstrate the need to devise strategies to improve the monitoring of the registration, follow-up and care of smear-positive cases in tertiary care hospitals in Pakistan. The decentralisation of services may be one option. National consensus is needed on an approach to trace and register these infectious patients. Moreover, the failure to account for these patients in routine reports may lead to false estimates of treatment success.⁴

This study documented a higher yield of sputum smear examination of suspects in rural health centres. This might be due to a lower level of awareness of health care staff in requesting sputum smear examination or delayed presentation of the patients for diagnosis.

The study was limited by the fact that it was confined to one district of the country and used routinely recorded data; the accuracy and completeness of the data could therefore not be ensured. After the implementation of measures addressing the problem, there will be a further need to re-evaluate these to document whether

the registration of smear-positive patients improves in tertiary care hospitals. This is in line with NTP plans for improved coordination of hospital services with other services providing TB care.

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Contexte : L'étude a été menée pour les patients enregistrés au cours de l'année 2009 dans l'ensemble des centres de diagnostic de tuberculose (TB) du district de Rawalpindi, Pakistan, comportant cinq hôpitaux de soins tertiaires et 16 centres de santé ruraux.

Objectif : Identifier des patients dont les frottis de crachats étaient positifs dans le registre de laboratoire et qui n'avaient pas été inscrits dans le registre de traitement ; ces patients ont été définis dans l'étude comme « perdus de vue initiaux ».

Schéma : L'étude a consisté en une révision rétrospective des données TB de routine dans les dossiers.

Résultats : Au total, 16 145 suspects ont été dépistés pour la TB et inscrits dans les registres de laboratoire. Sur les 1698 patients à bacilloscopie positive inscrits dans les registres de laboratoire, 101 (6%)

n'ont pas pu être retrouvés dans les registres de traitement. Dans les hôpitaux de soins tertiaires, le nombre de patients qui n'ont pas pu être retrouvés a été de 86/842 (10%), par comparaison avec les centres de santé ruraux où 15/856 (2%) n'avaient pas été enregistrés (OR 6,4 ; IC95% 3,6–11,6 ; $P < 0,01$).

Conclusion : Cette étude démontre une association significative entre le type de service de santé et les perdus de vue initiaux. Dans les centres de santé ruraux, la proportion est faible, ce qui reflète une efficacité des soins meilleure que celle des hôpitaux de soins tertiaires. Des stratégies s'imposent d'urgence pour améliorer l'enregistrement et le suivi des cas à bacilloscopie positive des frottis dans les institutions de soins tertiaires.

Marco de referencia: Todos los pacientes registrados durante el 2009 en todos los centros de diagnóstico de la tuberculosis (TB) del distrito Rawalpindi de Pakistán: cinco hospitales de atención terciaria y 16 centros rurales de atención de salud.

Objetivo: Identificar a los pacientes consignados en el registro de laboratorio con baciloscopia positiva del esputo que no aparecen en el registro de tratamiento y se designaron en el estudio como 'pérdidas iniciales durante el seguimiento'.

Método: Fue éste un estudio retrospectivo de los datos de los registros corrientes de TB.

Resultados: Se encontraron 16 145 casos con presunción clínica de TB en quienes se practicó el estudio diagnóstico y quedaron consignados en los registros de laboratorio. De los 1698 pacientes con baciloscopia positiva de los registros de laboratorio, 101 (6%) no se pu-

dieron localizar en los registros de tratamiento. En los hospitales de atención terciaria, no se encontraron 86/842 pacientes (10%) con resultado positivo en el laboratorio y en los centros rurales de atención de salud no se localizaron 15/856 casos registrados (2%) con baciloscopia positiva (OR 6,4; IC95% 3,6–11,6; $P < 0,01$).

Conclusión: El estudio pone en evidencia una asociación significativa entre el tipo de establecimiento sanitario y las pérdidas iniciales durante el seguimiento de pacientes con TB. En los centros rurales la proporción es baja, lo cual corresponde a una atención más eficiente que en los hospitales de atención terciaria. Se precisan con urgencia estrategias que mejoren el registro y el seguimiento de los casos con baciloscopia positiva en los establecimientos de atención terciaria de salud.