Can the number of patients with presumptive tuberculosis lost in the general health services in Pakistan be reduced?

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SUMMARY

The frequency of patients with presumptive tuberculosis (TB) who are not investigated by sputum smear microscopy is unknown in Pakistan. Using a simple intervention comparing patient and laboratory registers, patients with presumptive TB were identified in two districts from July to December 2013, a list of missing patients was prepared and the patients traced. The intervention significantly reduced the number of patients with presumptive TB lost, from 8.5% before the intervention to 6.9% after. A systematic comparison of out-patient and laboratory registers, followed by tracing missing persons, can reduce the proportion of patients with presumptive TB lost before diagnosis.

KEY WORDS: TB; patients with presumptive TB; loss to follow-up; health facilities; case detection; Pakistan

IN 2013, PAKISTAN RANKED THIRD among the countries with the highest number of estimated tuberculosis (TB) cases who were not notified (‘missing’).1 Pakistan has an estimated TB prevalence of 342 per 100 000 population, an incidence of 275/100 000 and a case detection rate of 58% for all types of TB cases; 298 446 cases were notified in 2014.1 The Pakistan National Tuberculosis Control Programme (NTP) aims to rapidly diagnose and treat all TB cases, and minimise loss to follow-up. Routine practice in health facilities is to record all patients with TB symptoms seeking health care in general out-patient registers. The management of these patients with presumptive TB depends on further investigations. A separate register for patients with presumptive TB has been recommended in Pakistan (World Health Organization. Review of TB care in Pakistan. Unpublished, available on request), but has not as yet been implemented.

Many studies have focused on TB cases lost after diagnosis;2,3 however, loss to follow-up of patients with presumptive TB before diagnosis is rarely examined. It has been observed that a substantial number of patients with presumptive TB are lost before diagnosis. Patients with TB symptoms who are lost to further investigations are defined as those patients identified with presumptive TB and recorded in out-patient registers who fail to be recorded in the laboratory register for any reason.

METHODS

Study design
A cohort study to compare notification rates in four districts was undertaken in 2013. In intervention districts, details of patients with presumptive TB recorded in the general out-patient register in Quarter 3 (Q3) and Q4 were looked for in the laboratory register, and a list of those not found was made.

Setting
The NTP of Pakistan (population: 180 million in 141 districts)4 is responsible for TB control; all public health facilities (n = 668) report to the NTP and receive supervision and guidelines. Various private health facilities also work with the NTP. Case detection is mainly based on clinically identifying patients with presumptive TB and referring them to a laboratory for sputum smear microscopy.

The districts of Faisalabad and Chakwal were selected for the study intervention, and two adjacent districts (Okara and Khushab) that were similar to the intervention districts with respect to population, number of diagnostic centres and demographic...
indicators were selected as controls. No intervention was carried out in the control districts. By comparing case notifications in intervention and control districts, the effectiveness of the intervention was assessed indirectly.

Data collection procedure

The number of cases notified for the whole of 2013 was obtained. In Q3 and Q4, the intervention in the two districts consisted of identifying the names of patients with presumptive TB in the general out-patient registers and tracing these in the laboratory registers. We included all types of health facilities, including basic health units (BHUs), rural health centres, district hospitals, tertiary care hospitals and attached laboratories that followed the DOTS strategy and reported to the NTP. The current diagnostic algorithm is to refer patients with presumptive TB to a laboratory for microscopy; this was followed in all health facilities in both the intervention and control areas.

In the intervention districts, medical officers were instructed to identify, in red, the names of patients with presumptive TB recorded in the out-patient registers in 2013. DOTS facilitators were then instructed to compare the out-patient register with the laboratory register from July to December 2013 on a weekly basis and to contact patients with presumptive TB by telephone to explain the need for testing. Patients with presumptive TB recorded from January to June 2013 were only identified in the general out-patient register and a list of missing cases was prepared, but no attempt was made to trace missed cases. The diagnostic steps followed were similar at both the intervention and the control sites, but the names of patients with presumptive TB were not circled in red and out-patient and laboratory registers were not compared. Supervisory visits were carried out regularly by the monitoring team to ensure proper implementation of the study intervention.

Data were entered into an Excel template (Microsoft, Redmond, WA, USA) and analysed using STATA, v12.0 (StataCorp, College Station, TX, USA).

As the intervention was a 1-year extension of routine supervisory activities as part of an established public health programme, no ethics clearance was required. Patients with presumptive TB were defined as those who presented with symptoms or signs suggestive of TB.5

RESULTS

Table 1 shows the distribution of health care facilities and population in the intervention and control districts. Table 2 shows the number of lost patients with presumptive TB who were identified in the intervention districts before and after the intervention. The intervention significantly reduced the loss of patients with presumptive TB, from 8.5% to 6.9%. In the intervention districts, TB case notifications increased from 1877 cases in Q1 and Q2 to 2081 cases in Q3 and Q4, while in the control districts case notifications fell from 1293 in Q1 and Q2 to 1213 in Q3 and Q4. The change in case notifications was significantly different in the intervention and control districts (odds ratio 1.2, 95% confidence interval 1.1–1.3).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Baseline characteristics of intervention and control districts, Pakistan, 2013</th>
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<tbody>
<tr>
<td></td>
<td>Intervention districts</td>
</tr>
<tr>
<td></td>
<td>Chakwal</td>
</tr>
<tr>
<td>Population</td>
<td>1358024</td>
</tr>
<tr>
<td>Facilities with TB services</td>
<td></td>
</tr>
<tr>
<td>PHC</td>
<td>74</td>
</tr>
<tr>
<td>Hospital-based*</td>
<td>3</td>
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</tbody>
</table>

* Includes district hospitals, tertiary care hospitals and teaching hospitals.

TB = tuberculosis; PHC = primary health care facilities.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Missing patients with presumptive TB before and after the intervention,* and the impact on case notification of the intervention in selected districts, Pakistan, 2013</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pre-intervention n (%)</td>
</tr>
<tr>
<td>Patients with presumptive TB</td>
<td>13183 (100)</td>
</tr>
<tr>
<td>Lost patients with presumptive TB</td>
<td></td>
</tr>
<tr>
<td>At all levels</td>
<td>1119 (8.5)</td>
</tr>
<tr>
<td>At primary care level</td>
<td>1027 (7.8)</td>
</tr>
<tr>
<td>At hospital level</td>
<td>92 (0.7)</td>
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</tbody>
</table>

* Cross-checking laboratory and patient registers.
† The difference in absolute numbers and percentage.

TB = tuberculosis; RR = risk ratio; CI = confidence interval.
DISCUSSION

Our study suggests that a simple intervention consisting of the identification of patients with presumptive TB in out-patient registers and comparing these with laboratory registers on a weekly basis significantly reduces the loss of patients with TB symptoms. Loss to follow-up of patients with presumptive TB in two districts of Pakistan was reduced from 8.5% to 6.9%. We conclude that the follow-up of patients with presumptive TB from out-patient departments and comparing these with laboratory registers followed by further tracking is an effective strategy.

As previous studies have mainly focused on loss to follow-up of TB cases after diagnosis, evidence on loss before diagnosis is limited. A study by Rao et al. reported that 28% of the names of TB patients in laboratory registers had not been recorded in the treatment registers; the most common reason for this was patient dissatisfaction with the services provided. The largest proportions of patients with symptoms lost to follow-up were at the primary and secondary levels, where most patients present first. The intervention reduced the proportion of lost patients by 4%, and this reduction was observed throughout the primary level (Table 2).

The increase in case notifications in the intervention districts may have been caused by regular seasonal variations; however, this is unlikely, as a similar increase was not observed in the control districts. This may also have been due to the additional health care activities being undertaken in the intervention districts. Although the total population of the intervention districts was larger, the population per facility was comparable (34 477 inhabitants/health centre in the intervention districts vs. 26 579 in the control districts). We therefore believe that the increase in notifications in the intervention districts (n = 204) may have been partly due to the return of lost patients (n = 49), as we were not able to determine any other cause for the increase. We recommend the assessment of other factors during future scale-up of similar interventions.

A strength of the study is that it reflects the ground reality in Pakistan and used a simple field intervention involving DOTS facilitators in tracing patients with presumptive TB. The study also has several weaknesses. It is difficult to ensure the accuracy and completeness of routine data such as those used in this study. The weekly visit and the supervisory visits in the intervention districts may have made health personnel more aware of patients lost. Moreover, loss to follow-up was reduced but not eliminated. The exact number of cases resulting from the intervention is unknown, as no other record of these cases was maintained.

The results of the study demonstrate the need to adopt simple strategies to minimise loss of patients with presumptive TB before diagnosis, and a simple comparison of out-patient registers and laboratory registers could make a difference. Our study also highlights the need for investigations to determine additional ways to further minimise this problem.

CONCLUSION

A simple comparison of out-patient and laboratory registers on a routine basis and tracing lost patients with TB symptoms can be effective in minimising loss to follow-up of patients with presumptive TB. Such a strategy should be replicated and tested elsewhere, complemented by other studies where improved coverage of testing for presumptive TB cases leads to improved diagnosis and treatment.

Acknowledgements

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Conflicts of interest: none declared.

References

On ignore la fréquence des patients prétuberculeux ne bénéficiant pas d’un examen microscopique des frottis de crachats au Pakistan. Dans deux districts, entre juillet et décembre 2013, les patients suspects de tuberculose (TB) ont été identifiés par une intervention simple en comparant les registres des patients et ceux des laboratoires ; une liste de patients manquants, prétuberculeux, a été préparée et les patients ont été recherchés. Cette intervention a significativement réduit la proportion de patients avec une TB prétendue mais perdus de vue de 8,5 % à 6,9 % après l’intervention. Une comparaison systématique des registres de consultation et de laboratoire suivie d’une recherche des patients manquants peut diminuer la proportion de patients perdus de vue alors qu’ils ont une présomption de TB.

Se desconoce la frecuencia de casos de pacientes con presunción diagnóstica de tuberculosis (TB) en quienes no se practica la baciloscopia del esputo en Pakistán. Mediante una intervención sencilla de comparación de los registros de pacientes y los registros de los laboratorios, se buscaron los pacientes con presunción clínica de TB en dos distritos de julio a diciembre del 2013. Se elaboró una lista de los pacientes con presunción clínica que se habían perdido de vista y se investigaron. La intervención disminuyó de manera considerable, de 8,5 % a 6,9 %, el número de pacientes con diagnóstico probable de TB con quienes se había perdido el contacto. Una comparación sistemática de los registros de pacientes ambulatorios y de los registros de laboratorio, seguida de la búsqueda de las personas faltantes, disminuye la proporción de pacientes con presunción diagnóstica de TB, cuyo seguimiento no se lleva a cabo.