Smokeless tobacco use among patients with tuberculosis in Karnataka: The need for cessation services


ABSTRACT

Background. India is home to the largest population of patients with tuberculosis and tobacco users in the world. Smokeless tobacco use exceeds smoking and is increasing. There is no study to date that reports smokeless tobacco use before and after the diagnosis and treatment of tuberculosis. We assessed smokeless tobacco use among former patients of tuberculosis in Karnataka, India.

Methods. We conducted a community-based, cross-sectional study among 202 men, who had been diagnosed and treated for tuberculosis (mean age 48 years), selected by multistage, random sampling. Using a semi-structured interview schedule, retrospective smoking and smokeless tobacco use were captured at eight time-points before and after the diagnosis and treatment of tuberculosis.

Results. Most patients suspended tobacco use during treatment. A high 44% prevalence of smokeless tobacco use 6 months before diagnosis was reduced to just 8% during the intensive phase of treatment and climbed to 27% 6 months after treatment. The tobacco use relapse rate 6 months after completion of treatment was higher for smokeless tobacco use (52%, 95% CI 41%–62%) than for smoking (36%, 95% CI 26%–45%). We also found that many patients who were advised to quit smoking continued using smokeless tobacco after completion of treatment. Additionally, new smokeless tobacco use was documented. Of the 11 new exclusive smokeless tobacco users, 10 shifted from smoking to smokeless tobacco use as a form of harm reduction.

Conclusion. Patients with tuberculosis are advised by their doctors, at the time of diagnosis, to quit smoking. Several patients shift from smoking to smokeless tobacco use, which needs to be addressed while providing tobacco cessation services.


INTRODUCTION

India has the highest burden of tuberculosis (TB) in the world with 1.98 million new cases occurring annually. It has been estimated that two of every five Indians are infected with the TB bacillus and among them at least 10% will develop TB during their lifetime. The WHO estimates that in 2006 in India, nearly 325 000 people died of TB with a mortality rate of 28 per 100 000 persons. The disease accounted for 17.6% of deaths from communicable diseases and 3.5% of all-cause mortality in India in 2004. Seventy percent of patients with TB in India are from the economically productive age group of 15–54 years, resulting in an economic loss of about 170 million workdays at a cost of US$ 3 billion annually.

India is also the second largest consumer of tobacco products and the third largest producer of tobacco in the world. Among adults in India, the use of smokeless tobacco (SLT) was almost double (26%) that of smoking (14%). The estimated number of tobacco users in India was 274.9 million. Of these, 163.7 million used only SLT, 68.9 million were smokers, and 42.3 million used both forms of tobacco. The prevalence of SLT use among adult men in India increased from 24% in 1995 to 33% in 2009, whereas the prevalence of smoking reduced from 35% to 24% during the same period. Several studies have demonstrated the association between smoking and the risk of pulmonary TB, relapse of TB and mortality due to TB. Aggressive tobacco control has been reported to avert 27 million deaths from TB attributable to smoking by 2050. There is also compelling data on the association of SLT with many diseases including TB. According to the Global Adult Tobacco Survey report, the quit rate of SLT users was much lower (5%) compared to smokers (13%) in India. There has been a call to implement smoking cessation strategies in TB control programmes. However, no such programmes were available for SLT users. Little data exist on the prevalence and patterns of SLT use among patients with TB in India.

We assessed SLT use at eight time-points in relation to the diagnosis and completion of treatment for TB and explored the quitting behaviour of SLT use among former patients of TB (who had completed the treatment 6 months before the interview).

METHODS

Udupi district, one of the most progressive districts of Karnataka state, was selected for the study. The district was ranked third among 29 districts according to the Human Development Index. Since <5% of women in Karnataka used any form of tobacco, we studied only men with TB. A cross-sectional survey was conducted in 2008 covering all three TB units in the district using multistage, random sampling. The list of all men with TB (≥18 years of age) who were cured or had completed treatment during the past two years was selected. A study was conducted among all men who were cured or had completed treatment during the past two years and were aged ≥18 years. The study was approved by the ethics committee of the institute.

Analysis was done by the statistical package SPSS 11.0. Disease status at diagnosis and treatment was recorded. The prevalence of smoking and SLT use were assessed before and after the diagnosis and treatment of tuberculosis. The results were expressed as percentages at different time points.

Most patients suspended tobacco use during treatment. A high 44% prevalence of smokeless tobacco use 6 months before diagnosis was reduced to just 8% during the intensive phase of treatment and climbed to 27% 6 months after treatment. The tobacco use relapse rate 6 months after completion of treatment was higher for smokeless tobacco use (52%, 95% CI 41%–62%) than for smoking (36%, 95% CI 26%–45%). We also found that many patients who were advised to quit smoking continued using smokeless tobacco after completion of treatment. Additionally, new smokeless tobacco use was documented. Of the 11 new exclusive smokeless tobacco users, 10 shifted from smoking to smokeless tobacco use as a form of harm reduction.

Conclusion. Patients with tuberculosis are advised by their doctors, at the time of diagnosis, to quit smoking. Several patients shift from smoking to smokeless tobacco use, which needs to be addressed while providing tobacco cessation services.


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quarters of 2007 was collected from the register kept in the TB units. From this list those who had completed TB treatment at least 6 months before the interview (June 2007 to December 2007) were selected for the study. There were 431 eligible men in the sample. With an anticipated prevalence of 15% of SLT use among this population,15 we estimated a minimum sample size of 179 to obtain 95% Cl within ±4%. With a possible reduction of 20% due to migration, death and incorrect address, we randomly selected 215 of 431 men. Of these, 6 patients had died and 7 persons could not be traced due to migration or incorrect address. The remaining 202 patients consented and were included in the study.

Data collection

Patients were interviewed at a place and time convenient to them after being contacted by a primary healthcare worker. Using a semi-structured pre-tested interview schedule, the following data were collected: details of basic demographic and socioeconomic characteristics, disease history, pattern of past and present tobacco use (both smokeless and smoking), alcohol consumption, and patient perceptions about links between relapse of TB and tobacco use. Data on tobacco use were collected at eight time-points: 6 months before diagnosis of TB, 1 week before diagnosis of TB, 1 week after diagnosis of TB, during the last week of the intensive phase of treatment, during the mid-period of the continuation phase of treatment, on completion of treatment, 3 months after treatment, and 6 months after treatment. All interviews were conducted in Kannada by one of the authors (KGD) using a modified interview instrument used in a similar study in India.15 The interview was conducted between June and September 2008. At the end of the study, the investigator gave tobacco cessation advice to encourage persistent and relapsed users to quit, and permanent quitters to stay abstinent from tobacco use.

Ethical clearance

Ethical clearance was obtained from the Institute Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, Kerala, India. Written permissions from the District Health Officer, District TB Officer and Medical Officers of TB control offices of the study area were also obtained. The purpose and voluntary nature of the study was explained to all patients and written informed consent was obtained from them.

Analysis

Ever tobacco users were categorized into three types at each reference time-points. Persistent user was a person who had never quit tobacco from the time of diagnosis to the reference point; relapsed user was one who had resumed tobacco use after having quit at some time in any of the reference periods; and a quitter was a person who quit tobacco from the previous reference point to the focal reference point.

Data analysis was done using SPSS 17.0 for Windows (SPSS Inc., Chicago, IL, USA). Abstinence, persistence and relapse at eight time-points in relation to diagnosis of TB and treatment completion were analysed separately for SLT use and smoking. Point prevalence with 95% CI was estimated for these variables. Patients were also asked about the content of cessation messages received during interactions with healthcare providers. These data were coded as to whether messages contained general advice—not to smoke; TB-specific advice—not to smoke, or advice not to chew during or following treatment. Those who did not routinely chew before diagnosis of TB and took up chewing following treatment were asked the reason for the change.

RESULTS

The mean (SD) age of our patients was 48.1 (15.6) years (range 18–80 years). A quarter of them (25%) were illiterate, 40% were unskilled labourers and 88% resided in rural areas. Eighty-one per cent of the patients had pulmonary TB, and of these two-thirds were cured by 6 months of standard directly observed, short course (DOTS) therapy. Of the 202 study patients, 106 (52%) were users of any form of tobacco at the time of the survey. Among the tobacco users, 33 patients were exclusive smokers, 60 were exclusive SLT users and 13 of them used both forms of tobacco (Table I). At the time of survey, 62 (31%) patients were alcohol users.

Tobacco use trajectories

A high 44% prevalence rate of SLT use, 6 months before diagnosis of TB reduced to just 8% during the intensive phase of treatment and increased to 27% at 6 months after treatment. Suspension of tobacco use during the intensive phase was related to loss of a desire to chew during the illness at a time when several medicines were being consumed and not as a result of any specific advice ‘not to chew’. Likewise, drops in rate of smoking occurred during the intensive phase. There was not just a relapse to former chewing rates after treatment ended but an increase in exclusive SLT use from 24% at 6 months before diagnosis to 30% at 6 months after completion of treatment. Of the 11 new exclusive SLT users, 10 patients shifted from smoking to SLT and 1 person who previously used both forms of tobacco, quit smoking and retained SLT use. When interviewed, these patients reported that they switched from smoking to SLT as a form of harm reduction. They had all been advised by their doctor to quit smoking when their diagnosis of TB was confirmed and although this advice had not specifically tied to TB relapse, several interpreted it to mean that it was not compatible with TB medication or a lung disease. They were not told by their doctors to quit chewing tobacco and did not associate chewing tobacco with TB and or a lung disease.

The prevalence of smoking and SLT use was 51% and 44%, respectively, 6 months before the diagnosis of TB. One week after the diagnosis of TB, the prevalence of smoking was 10% and that of SLT use was 11%. The prevalence of smoking and SLT use increased to 20% and 31%, respectively, after 3 months of completion of treatment. Six months after completion of treatment, smoking prevalence further increased to 23% and SLT use to 36%.

Of the 88 patients who were current SLT users 6 months before the diagnosis of TB, 7 quit one week before being diagnosed with TB. Another 64 patients quit within one week of diagnosis. After that no patient quit tobacco use during the intensive phase of treatment. Six months after completion of treatment, 19% persisted with tobacco use, more than one-third (39%) quit and 42% of users resumed SLT use (Table II).

<table>
<thead>
<tr>
<th>Table I. Pattern of tobacco use among patients with tuberculosis (n=202)</th>
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<tbody>
<tr>
<td>Type</td>
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<tr>
<td>------</td>
</tr>
<tr>
<td>Any form of tobacco</td>
</tr>
<tr>
<td>Smokeless only</td>
</tr>
<tr>
<td>Smoking only</td>
</tr>
<tr>
<td>Both forms of use</td>
</tr>
<tr>
<td>Non-users</td>
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<td>* at the time of survey</td>
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The proportion of persistent users was higher for SLT use (19%) compared to smoking (14%). The relapse rate was also higher for SLT (42%) use compared to smoking (31.1%) at 6 months after completion of treatment (Table II).

DISCUSSION

In our study, 88% of 202 patients with TB surveyed in Udupi district of Karnataka, ever used some form of tobacco. The prevalence of ever use of SLT was much higher as compared to the prevalence of SLT among newly diagnosed patients with TB from Malaysia (29%).16 The prevalence of smoking 6 months before diagnosis was 51%, which was lower than that reported from Kerala14 and higher than 27.9% among adult men in Karnataka.14

The relapse rate of SLT use was much higher than that of smoking. We investigated the reason for this and found that most tobacco messages provided by doctors to patients were general in nature and focused on smoking. Hence, these patients felt they were heeding doctors’ advice to give up smoking and were now engaging in the use of SLT as a form of harm reduction, and as a nicotine substitution strategy. This suggests that more tobacco and TB-specific cessation messages need to be given to these patients. This is important because those who continue to smoke are more likely to have a relapse of the disease and those who relapse are more likely to develop multidrug resistant TB.17 Smokeless tobacco products are linked to oral cancers in India18 and studies have also shown that the use of SLT increases the risk of death from respiratory diseases and TB in men.9

A perception that SLT use is less harmful for patients with TB needs to be corrected, because of the serious health consequences of chewing tobacco. This perception may lead to a comparatively higher relapse of SLT. A high level of relapse of SLT use by patients who have been cured of TB clearly needs to be addressed. There has been a recent call to include tobacco cessation as a routine part of TB management protocols.11 In India, where the smokeless as well as the smoking form of tobacco are common, tobacco cessation efforts must focus on both smoking and the use of SLT. Previous research in India has found that tobacco cessation messages given to patients with TB are often general and not TB-specific. Our study confirmed that most doctors’ messages are general in nature, and even when addressing patients with TB tend to focus on quitting or reducing tobacco use during the illness and while taking treatment. Messages do not emphasize the necessity of quitting tobacco for good and educating patients about the higher chances of relapse of TB, if they resume use of tobacco after treatment has been completed. We also found that many patients with TB advised not to smoke continue SLT use after completion of treatment. Healthcare workers’ effort to advise TB patients to quit tobacco during and following treatment needs to be encouraged as a routine part of TB counselling and support. Likewise, DOTS providers and healthcare professionals need to be trained to offer tobacco cessation advice to patients and offer support.19,20

Limitations

Interviews with former patients of TB were conducted once, during which time the informants were asked to report on current as well as previous tobacco use over a one-year period. Data on tobacco use behaviour relies on self-report and may suffer from recall bias. However, similar reports are available in the literature.15 Former patients were interviewed largely at home in the presence of other family members who assisted them in recalling past behaviour and confirmed information offered to the interviewer. The findings of our study are not generalizable to all patients with TB since we studied patients who accessed TB units and completed treatment.

ACKNOWLEDGEMENTS

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REFERENCES


<table>
<thead>
<tr>
<th>Time-points</th>
<th>Smokeless tobacco use (n=88)</th>
<th>Smokers (n=103)</th>
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<tbody>
<tr>
<td></td>
<td>Persistent n (%)</td>
<td>Relapsed n (%)</td>
</tr>
<tr>
<td>6 months before diagnosis</td>
<td>88 (100)</td>
<td>–</td>
</tr>
<tr>
<td>1 week before diagnosis</td>
<td>81 (92)</td>
<td>7 (7.9)</td>
</tr>
<tr>
<td>1 week after diagnosis</td>
<td>17 (19.3)</td>
<td>–</td>
</tr>
<tr>
<td>During intensive phase</td>
<td>17 (19.3)</td>
<td>0</td>
</tr>
<tr>
<td>During continuation phase</td>
<td>17 (19.3)</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>On completion of treatment</td>
<td>17 (19.3)</td>
<td>29 (32.9)</td>
</tr>
<tr>
<td>3 months after treatment</td>
<td>17 (19.3)</td>
<td>37 (42.0)</td>
</tr>
</tbody>
</table>

Smoking status presented was current smoking at each time-point.
A 38-year-old man was diagnosed to have bronchogenic carcinoma stage IIIb (T4N2M0). One week after the first cycle of chemotherapy, he developed breathlessness and pain during deglutition. CT scan showed an increase in the size of the mass with air in the mediastinum, both pleural cavities, subcutaneously in the chest wall and in the spinal canal (arrows). He died 12 hours after presentation. Spontaneous pneumomediastinum is very rare in patients with lung cancer. The possible mechanisms causing it include tumour ischaemia and bronchial occlusion.