

Brief advice to tuberculosis patients in Nepal to stop smoking: a pilot study by the Britain Nepal Medical Trust

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SUMMARY

SETTING: Tuberculosis (TB) treatment centres in Eastern Nepal.

OBJECTIVE: To determine smoking cessation rates among TB patients advised to quit.

DESIGN: One intervention and one control centre were studied. At the intervention centre, brief advice about smoking and cessation was given at the start of anti-tuberculosis treatment, and repeated 2 and 5 months later. After 6 months of standard treatment, patients were asked about quitting. Expired air carbon monoxide (CO) was measured in those claiming 6 months of abstinence.

RESULTS: None of the 51 controls achieved 6 months of abstinence, whereas 77 (39%) of the 195 in the

intervention group claimed at least 6 months of abstinence. All claims were verified by CO measurement in expired air (95%CI 31.4–47.6, $P < 0.0001$ for the difference in smoking cessation).

CONCLUSION: Brief advice on smoking cessation to patients starting anti-tuberculosis treatment in the National Tuberculosis Programme (NTP) setting in Eastern Nepal led to 39% quitting for least 6 months. Our results should encourage randomised trials in smokers with TB in Nepal: if substantiated, smoking cessation advice should become a mandatory component of the NTP.

KEY WORDS: quitting smoking; TB patients; Nepal

THE HARMFUL HEALTH EFFECTS of cigarette smoking are well known to health professionals, as are the benefits of stopping^{1,2} When patients present to health services, the opportunity to identify smokers and to advise them to stop should therefore be utilised. Cigarette smoking is associated not only with tuberculous infection and tuberculosis (TB) disease, but also with delayed culture conversion, increased infectivity, relapse and death from TB.^{3–10}

Data on the prevalence of smoking among TB patients in Nepal are not available. However, from late 1998, radio and television advertising of tobacco products were partially banned by the Government of Nepal. A national survey in 2011 revealed that 30% of men and 9% of women in Nepal were current cigarette smokers,¹¹ and poorer, less educated and older people were known from a previous study to smoke more than other categories.¹² The Government's Tobacco Products (Control and Regulation) Directives 2011 subsequently banned smoking and the use of tobacco in public places, forced manufacturers to put warning messages and pictures in/on the packets of tobacco products and levied import and export duties on tobacco products. The National

Health Education and Communications Centre of the Ministry of Health and Population was made primarily responsible for anti-tobacco activities. The Centre produces print, audio and audio-visual educational materials on the harmful effects of tobacco. Details of these activities and any evaluations have not yet been published.

The Britain Nepal Medical Trust (BNMT), which works within the National Tuberculosis Programme (NTP) in Nepal to help ensure prompt diagnosis and good treatment of TB, has conducted a pilot study of the impact of brief advice to stop smoking in smokers starting treatment for TB, which we believe to be the first of its kind in Nepal.

STUDY POPULATION AND METHODS

Setting and study criteria

Patients attending four treatment centres in two Districts of the Terai (plains region) in Eastern Nepal to start treatment for smear-positive pulmonary TB, who were aged ≥ 16 years, who smoked cigarettes and who agreed to participate in a study on smoking habits, were asked about smoking. Tobacco users

other than cigarette smokers were excluded, as were those with other forms of TB and those judged incapable of giving informed consent. Demographic data, including details of smoking habits, were recorded for patients agreeing to participate in the study. At two of the treatment centres, smokers were given simple information about the harm from smoking, including its negative association with TB and its effect on children's health and education, followed by brief advice about stopping (intervention group): the advice was given over approximately 10 min to the patient at the beginning of anti-tuberculosis treatment by the member of staff responsible for treatment at the treatment centre. At 2 and 5 months into anti-tuberculosis treatment, the advice was repeated for between 5 and 10 min. At the other two treatment centres, patients were simply asked whether or not they smoked (control group). Allocation of treatment centres to the intervention and control groups was done with the aim of balancing numbers of smear-positive pulmonary TB patients in the two groups. At the end of the 6-month course of anti-tuberculosis treatment, patients in both groups were asked whether they had stopped smoking and when. Expired air carbon monoxide (CO) was measured in those claiming abstinence, using piCO+ Smokerlysers® (Bedfont Scientific, Maidstone, UK).

Staff at all four treatment centres were familiarised with the two forms to be completed during the study (at entry and at 6 months), trained to record demographic data (including smoking habits) and trained to measure expired air CO by the BNMT TB Manager and the BNMT TB District Programme Co-ordinators in December 2008. Staff at the intervention treatment centres were also trained to give brief advice. The BNMT staff members had themselves received training in September 2008 from the BNMT TB Programme Director. Earlier that month, the Programme Director had received 2 days of training from an experienced Smoking Cessation Counsellor based at Llandough Hospital in Cardiff, South Wales, UK. In late 2010, refresher training was given by one of the authors (GMCH) to the BNMT staff, who then gave refresher training to the staff at the treatment centres. In addition to conducting initial staff training at the treatment centres, the BNMT TB District Programme Co-ordinators were involved in the supervision of data collection and scrutiny of the data during the study period. The Smokerlysers were returned to the UK for recalibration, servicing and/or repair at intervals during the study.

Ethics and analysis

The protocol was approved by the National Health Research Council of Nepal. Written, informed consent to participate in the study was obtained from each patient by the member of staff responsible for his/her anti-tuberculosis treatment.

The primary end point of the study was claimed continuous abstinence for ≥ 6 months, which was biochemically verified at 6 months. The proportions of patients in the intervention and control groups who claimed that they had stopped smoking for at least 6 months, and whose claims of quitting smoking were validated by expired CO levels of ≤ 10 ppm (parts per million), were compared. Success rates were analysed further by sex. Pearson's χ^2 test, with Yates' continuity correction, was used to test for statistical significance using R version 3.0.0 (R Computing, Vienna, Austria).

At the end of anti-tuberculosis treatment, the information on how many months had elapsed since the patient had stopped smoking at one of the intervention centres and one of the control centres was lacking for so many patients as to render meaningful analysis of 6-month quit rates impossible. The analysis was therefore limited to patients from the other two treatment centres: Biratnagar in Morang District (intervention group) and Mirchaiya in Siraha District (control group). The treatment centre in Biratnagar is staffed and run by the Nepal Anti-Tuberculosis Association (NATA), a non-governmental organisation, according to the NTP guidelines. The treatment centre at Mirchaiya is a government-run primary health centre at which diagnosis and treatment of TB is performed according to NTP guidelines. Biratnagar is an urban and semi-urban area, with a population of around 200 000; Mirchaiya is a rural community of around 100 000. Employment prospects and transport links are better in Biratnagar.

RESULTS

The intake to the study was delayed until 2011 due to external factors in Nepal and internal problems within the BNMT. By the end of 2012, a total of 246 patients had been recruited to the study: 195 to the intervention group at the Biratnagar treatment centre and 51 to the control group at the Mirchaiya treatment centre. Although similar in marital status (90% married) and religion (over 90% Hindu), there were some demographic differences between the groups: the control group was less well educated, contained a larger proportion of females and tended to smoke less than the intervention group, which itself had a larger proportion of individuals aged < 40 years and fewer aged 41–70 years compared with the control group (Table). Completed end-of-treatment forms were available for 187 of the 195 intervention patients and 44 of the 51 controls: information on smoking status at the end of treatment was thus not available for 8 intervention and 7 control patients. None (0%) of the control group claimed at the end of treatment to have stopped smoking for 6 months, whereas in the intervention group, 77 (39%) of the 195 patients claimed to have stopped smoking for at

Table Characteristics of the intervention and control groups on entry to the study

	Intervention group (n = 195) %	Control group (n = 51) %
Age, years*		
<40	49	37
41–70	43	55
>70	8	4
Females	18	31
Education†		
No education	59	82
Primary school only	22	4
Secondary school and higher education	19	10
Smoking habits‡		
Smoked daily	58	47
Smoked occasionally	41	45
Average number of cigarettes smoked daily§		
1–5	39	41
6–9	45	55
≥10	16	0

* Information missing in 2 control patients.

† Information missing in 2 control patients.

‡ Information missing in 1 intervention and 4 control patients.

§ Information missing in 2 control patients.

least 6 months after entry into the study, all of whom were confirmed as quitters by measurement of expired air CO (Pearson's χ^2 test with Yates' continuity correction 27.51 on one degree of freedom, 95%CI 31.4–47.6, $P < 0.0001$, for the difference in smoking cessation). Of the 195 males in the study as a whole, 60 (31%) successfully quit smoking, while 17/51 females (33%) successfully quit (not significantly different, $P > 0.5$). In the intervention group, 60 (38%) of 160 males and 17 (49%) of 35 females quit smoking (not significantly different, $P > 0.3$).

DISCUSSION

In patients starting treatment for smear-positive pulmonary TB in Eastern Nepal, brief simple advice to stop smoking resulted in a significant number (39%) quitting the habit for 6 months. This rate was lower than that observed in the Sudan by El Sony et al., who reported that after brief, repeated advice from health workers, 47% of smokers among patients being treated for TB claimed to have stopped smoking for ≥ 6 months; however, there was no biochemical validation of the claims and females were not recruited into that study.¹³ In Malaysia, Awaisu et al. reported the SCIDOTS study, in which 78% of 68 patients in the intervention group claimed at 6 months to have been abstinent from smoking for the previous 4 weeks and had expired air CO levels consistent with the claims, compared to 9% in a control group. In that study, smokers who resolved at the start of anti-tuberculosis treatment to stop

smoking within the next 30 days were assigned to the intervention group of highly intensive smoking cessation advice, support and pharmacotherapy during treatment. However, if the smokers were in the pre-contemplative or contemplative stage of quitting, they were allocated to the control group.¹⁴ Siddiqi et al. reported that in 106 patients being treated for TB in Pakistan, intensive advice and support to stop smoking resulted in 70% of patients having expired air CO levels of ≤ 9 ppm at both 1 and 6 months, compared with 14% of those in a control group.¹⁵ In Bangladesh, Siddiquea et al. found that smoking cessation advice given to 615 patients being treated for TB resulted in 75% saying that they had not smoked for 2 weeks prior to their appointment at 6 or 8 months, with verification of their statements from family members.¹⁶ The frequency of smoking cessation advice in that study was considerably greater than in our study in Nepal.

In Romania, only 18% of 61 smokers with TB, who had received minimal smoking cessation advice at the beginning of and during anti-tuberculosis treatment, quit at some time during treatment and were not smoking at 6 months. Expired air CO was used to validate claims of quitting.¹⁷ Among patients with smoking-related diseases who were in hospital or attending hospital out-patients in the UK, brief advice from the doctor resulted in 1-year, sustained, validated quit rates of 5–10%.^{18–20} In Nepal, the results of brief advice to patients with TB to stop smoking were considerably better than the results in the UK and in Romania. This difference may reflect cultural differences in response to health professionals, but may also have occurred because the patients in our study smoked less than those in UK and Romania, and were thus likely to be less addicted to nicotine. Similar factors may partly explain the superior results in Malaysia, Pakistan, Bangladesh and Sudan, compared with the UK and Romania. However, a number of other factors about the populations and methods in those four studies^{13–16} were different from the UK and Romanian studies^{17,18,20–23} and from ours. It is possible also that the fear of TB and the information that the treatment outcome for TB was not as good among smokers acted together to improve the quit rates. The fact that all of the claimed non-smokers in Biratnagar had expired air CO levels of ≤ 10 ppm is at odds with the fact that, in smoking cessation studies in UK patients, up to 20% of claims of non-smoking are not supported by the expired air CO results.^{18,20–23} In our intervention group, there was a trend for females to be more successful than males at stopping smoking, which is in contrast with the findings in populations of UK patients.^{19–22} If the trend were to be confirmed in future studies, cultural differences between the populations in Nepal and UK, including different smoking habits, might again be an explana-

tion. It is perhaps surprising that in the control group none of the 44 patients on whom there was information at the end of TB treatment gave up smoking. This result may reflect the difficulty in disseminating knowledge in general about health and in particular about smoking among the population in rural areas of Nepal.

A strength of our study was that it was conducted within the routine NTP operations of a developing country, utilising existing staff involved in the treatment of patients with TB. Such staff were trained to give brief advice by members of staff of BNMT, an international non-governmental organisation already involved in training and supervision of staff at the NTP. Another strength is the strict definition of successful quitting, i.e., claimed abstinence from cigarettes for ≥ 6 months and validation of those claims by expired air CO.

One weakness of the study was that allocation to intervention or control was not randomised. A further weakness was the delay of just over 2 years between the original training and the start of the intake, which arose mainly as a result of administrative problems within BNMT, but also as a result of political and social unrest in Nepal. This delay may explain why there were failures to complete the end of treatment forms satisfactorily in two of the original four centres and why supervision of those centres by BNMT staff was insufficient in detecting and rectifying the problems, although refresher training was given in late 2010. These failures emphasise the importance of maintaining motivation and skills during studies such as ours. The necessary exclusion from the analysis of two of the centres created the imbalance of numbers between the intervention and control groups, and in all likelihood contributed to the imbalance in various demographic factors between the intervention and control groups: in any further studies such imbalances can be minimised by within-centre randomisation of patients.

Our study lays the ground for future work in the field and it will be interesting to see whether our results can be replicated within the NTP in Nepal in prospective, randomised trials and whether cure rates, completion of treatment rates, relapse rates and death rates might be different between validated, sustained quitters and those who continue to smoke.

CONCLUSION

Brief advice to stop smoking, given to patients starting treatment for pulmonary TB in the setting of the NTP in Eastern Nepal, and repeated 2 and 5 months later, resulted in 39% of patients quitting for ≥ 6 months. In contrast, none of the patients in a control group stopped smoking for that length of time. Randomised trials should now be instituted in treatment centres in towns and in rural areas of Nepal

to firmly establish quit rates in TB patients given brief advice to quit smoking: if our results are replicated, the NTP should make smoking cessation advice a mandatory part of the routine management of smokers with TB.

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RESUME

CONTEXTE : Centres de traitement de la tuberculose (TB) dans l'Est du Népal.

OBJECTIF : Déterminer le taux d'adhésion parmi les patients tuberculeux auxquels on a recommandé d'arrêter la consommation de tabac.

SCHEMA : Un centre d'intervention et un centre témoin ont été étudiés. Dans le centre d'intervention, les patients ont bénéficié de brefs conseils à propos du tabac et de son arrêt au début du traitement antituberculeux et ces conseils ont été répétés 2 et 5 mois plus tard. Après 6 mois de traitement standard, on a interrogé les patients sur l'arrêt du tabac. Chez ceux qui affirmaient avoir arrêté, on a mesuré le monoxyde de carbone expiré (CO).

RÉSULTATS : Aucun des 51 témoins n'a été abstinent 6

mois tandis que 77 (39%) des 195 patients du groupe d'intervention affirmaient s'être abstenus au moins 6 mois, ces affirmations étant vérifiées par la mesure du CO dans l'air expiré (IC95% 31,4–47,6 ; $P < 0,0001$ pour la différence en arrêt du tabac).

CONCLUSION : Une brève recommandation en faveur de l'arrêt du tabac aux patients qui débudent un traitement antituberculeux dans le cadre du Programme National de lutte contre la Tuberculose (PNT), dans l'Est du Népal, a abouti à 39% de patients abstinentes pendant au moins 6 mois. Nos résultats devraient encourager des essais randomisés chez les fumeurs atteints de TB au Népal : s'ils confirment les résultats, la recommandation d'arrêter le tabac devrait devenir un élément obligatoire du PNT.

RESUMEN

MARCO DE REFERENCIA: Los centros que suministran el tratamiento de la tuberculosis (TB) en el oriente de Nepal.

OBJETIVO: Determinar la tasa de abandono del tabaquismo en los pacientes con diagnóstico de TB que reciben orientación en ese sentido.

MÉTODO: Se estudiaron un centro donde se aplicó la intervención y un centro testigo. En el centro de intervención se suministró una orientación breve sobre el tabaquismo y el abandono del hábito al comienzo del tratamiento antituberculoso y se repitió a los 2 y a los 5 meses. Después de 6 meses de tratamiento corriente, se interrogó a los pacientes sobre el abandono del tabaquismo y se midió el monóxido de carbono exhalado en los pacientes que refirieron abstinencia de 6 meses.

RESULTADOS: Ninguno de los pacientes en el grupo testigo logró el abandono a los 6 meses, pero 77 de los

195 pacientes (39%) del grupo de intervención refirieron un mínimo de 6 meses de abstinencia; todas las declaraciones de abstinencia se verificaron con la prueba del monóxido de carbono en el aire exhalado (IC95% 31,4–47,6; $P < 0,0001$ para la diferencia en la tasa de abandono del tabaquismo).

CONCLUSIÓN: En el oriente de Nepal, una breve orientación sobre el abandono del tabaquismo a los pacientes que comienzan el tratamiento antituberculoso en el marco del Programa Nacional contra la Tuberculosis (PNT) condujo a un 39% de abandono del hábito, como mínimo durante 6 meses. Estos resultados deben impulsar la realización de ensayos aleatorizados en pacientes fumadores en quienes se diagnosticó la TB en Nepal; en caso de confirmación del resultado, la orientación sobre el abandono del tabaquismo se debería convertir en un componente obligatorio del PNT.