

Does Connecting Tobacco Cessation Intervention with Tuberculosis Care Improve Quality of Life Outcomes?

Ahmed Awaisu¹, Mohamad Haniki N. Mohamed², Noorliza M. Noordin³, Noorizan Abd. Aziz⁴, Syed Azhar S. Sulaiman⁵, Aziah A. Mahayiddin⁶, and Abdul Razak Mutalif⁷

¹College of Pharmacy, Qatar University, ²Kulliyah of Pharmacy, IUM, Malaysia, ³Institute for Health Management, Ministry of Health, Malaysia, ⁴Faculty of Pharmacy, Universiti Teknologi Mara, Malaysia, ⁵School of Pharmacy, Universiti Sains Malaysia, ⁶Institute for Respiratory Medicine, Malaysia, ⁷Penang Hospital, Malaysia

Background

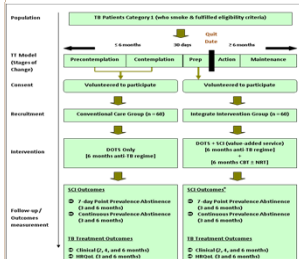
- The colliding epidemics of tuberculosis (TB) and tobacco smoking are global phenomena of public health importance.^{1,2}
- There is unequivocal evidence that smoking is an established risk factor of TB infection, active TB disease, and poor treatment outcomes.³⁻⁶
- Smoking-related immunological abnormalities in TB are reversible within 6 weeks of smoking cessation.
- Connecting TB and tobacco cessation interventions has been strongly advocated as this may produce significant benefits.⁷
- Guidelines on provision of tobacco treatment in TB settings have recently been developed.⁸
- There is apparent lack of evidence of benefits of connecting the treatment of TB and tobacco dependence.²
- No study has documented the evidence of humanistic impacts of such integrations.
- SCIDOTS Project is a pilot project conducted from the context of a developing nation to determine the impact of the integration on quality of life (QoL) and other outcomes.

Study Objective

- To document the impact of connecting TB directly observed therapy short-course (DOTS) with smoking cessation (SCI) on QoL and other outcomes.

Methodology

- Prospective non-randomized comparison group trial.
- 120 TB patients who were current smokers at the time of TB diagnosis.
- Patients assigned to either of two (2) groups: TB-DOTS plus smoking cessation (SCIDOTS) or conventional TB-DOTS only (DOTS).
- The effects of the novel intervention on HRQoL were measured using EQ-5D questionnaire.
- Other outcomes (tobacco cessation and overall TB treatment outcomes) were also determined.



Study Instrument & Data Analysis

- EQ-5D questionnaire was used for measuring the QoL of the study participants.
- QoL outcomes were measured periodically (baseline, 3 months, 6 months).
- Health state classifications in the descriptive system were converted into composite utility scores using the UK social tariff.
- Data were analyzed using Statistical Package for Social Sciences (SPSS[®]) version 18.0.



Results

R1. Characteristics of the Study Participants

Table 1. Demographic characteristics of the study participants (N = 86)

Characteristic	Control (DOTS) (n = 46)	Intervention (SCIDOTS) (n = 40)	p-value ^a
Mean age (years)	45.78 ± 14.42	41.62 ± 14.41	0.186 ^b
Mean body weight (kg)	50.33 ± 8.82	53.30 ± 10.67	0.162 ^b
Male gender, no. (%)	45 (97.8%)	40 (100.0%)	1.000
Ethnicity, no. (%)			0.431
Malay	29 (63.0%)	30 (75.0%)	
Chinese	11 (23.9%)	8 (20.0%)	
Indian	5 (10.9%)	1 (2.5%)	
Other	1 (2.2%)	1 (2.5%)	

^aFisher's exact test and ^bIndependent t-test were applied

R2. Effect of the Intervention on Smoking Cessation Outcomes

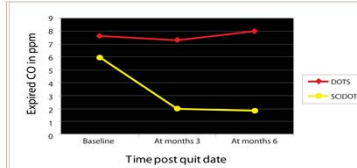


Figure 2. Breathe carbon monoxide (CO) monitoring

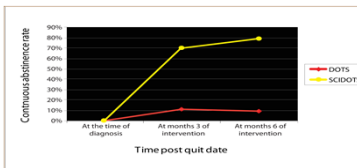


Figure 3. Quitting process dynamics between the integrated intervention and the usual care groups

R3. Effect of the Intervention on TB Treatment Outcomes

Table 2. Overall TB treatment outcomes at the end of treatment (6 months or later)

TB treatment outcome	DOTS (n = 46)	SCIDOTS (n = 40)	p-value ^a
Cured	24 (52.2%)	32 (80.0%)	0.019
Treatment completed	12 (26.1%)	7 (17.5%)	
Treatment interrupted	7 (15.2%)	1 (2.5%)	
Treatment failure	3 (6.5%)	0 (0%)	

^ap-value was calculated by using Fisher's exact test.

Results – contd

R4. Effect of the Intervention on HRQoL Outcomes

Table 3. Health-related quality of life outcomes

QoL outcome measure	DOTS (n = 46)	SCIDOTS (n = 40)	p-value ^b
EQ-5D utility index			
Baseline	0.70 ± 0.31	0.72 ± 0.20	0.72
3 months follow up	0.87 ± 0.22	0.91 ± 0.16	0.33
6 months follow up	0.91 ± 0.14	0.98 ± 0.08	0.01
EQ-VAS			
Baseline	57.04 ± 12.74	55.00 ± 13.83	0.48
3 months follow up	70.50 ± 13.62	73.60 ± 13.15	0.29
6 months follow up	73.87 ± 12.01	87.28 ± 11.44	<0.001

Plus-minus values are means ± SD; ^bp-values were calculated with the use of independent t-test for all continuous data reporting mean values.

Discussion

- Increase over time in biochemically-confirmed smoking abstinence was linear in the intervention group.
- The smoking cessation rates recorded at the end of 6 months post-quit date in this study (78%) are much higher than those reported in the general population.
- TB cure plus treatment completion rate was 97.5% in intervention (SCIDOTS) group vs. 78.3% in usual care (DOTS) group (p=0.019).
- Higher EQ-5D utility score gains and EQ-VAS gains were observed among patients who received the integrated intervention compared to those who received DOTS only.
- For the EQ-VAS, there were significant main effects for group [F (1, 84) = 4.91, p = 0.029, η² = 0.06], time [F (2, 168) = 139.50, p < 0.001, η² = 0.62] and group x time interaction [F (2, 168) = 13.89, p < 0.001, η² = 0.14].
- The results have potentially major practice and policy implications in the revision of TB treatment guidelines nationally and internationally.
- The lessons learnt from this pilot study can be applied to expansion and scale-up phases in the future.

Conclusion

- The findings suggest that combination of DOTS with smoking cessation has a great potential to yield better TB treatment outcome and HRQoL.

Acknowledgement

- The travel grant was provided by Qatar University, Doha, Qatar.
- The study was funded by a research grant from the Institute for Health Management, NIH, Ministry of Health, Malaysia.

References

- Biddig, K. & Lee, A. C. (2009) An integrated approach to treat tobacco addiction in countries with high tuberculosis incidence. *Trop Med Int Health*, 14, 420-428.
- Pai, M., Mahan, A., Chedra, K. et al. (2007) Local interaction: the colliding epidemics of tobacco and tuberculosis. *Expert Rev Anti Infect Ther*, 5, 385-391.
- Slama, K., Chang, C. Y., Enarson, D. A. et al. (2007) Tobacco and tuberculosis: a qualitative systematic review and meta-analysis. *Int J Tuberc Lung Dis*, 11, 1049-1061.
- Bates, M. N., Khalakdina, A., Pal, M. et al. (2007) Risk of tuberculosis from exposure to tobacco smoke: a systematic review and meta-analysis. *Arch Intern Med*, 167, 335-342.
- Lin, H. H., Ezzati, M. & Murray, T. (2007) Tobacco smoke, indoor air pollution and tuberculosis: a systematic review and meta-analysis. *PLoS Med*, 4, e20.
- Sastry, T., Gang, R., Forster, T. R. et al. (2000) Risk factors associated with default, failure and death among tuberculosis patients treated in a DOTS programme in Tiruvallur District, South India. 2000. *Int J Tuberc Lung Dis*, 4, 780-784.
- Awaisu, A., Nik Mohamed, M.H., Noordin, N.M. et al. (2011). The SCIDOTS Project: Evidence of benefits of an integrated tobacco cessation intervention in tuberculosis care on treatment outcomes. *Substance Abuse Treatment, Prevention, and Policy* 6:26. DOI: 10.1186/1747-597X-6-26.
- WHO & UNICEF (2007) *WHO/UNICEF The Union monograph on TB and tobacco control: Joining efforts to control two related global epidemics*. World Health Organization & International Union Against Tuberculosis and Lung Disease.
- Slama, K., Chang, C. Y. & Enarson, D. A. (Eds.) (2008) *Tobacco cessation interventions for tuberculosis patients. A guide for low income countries*. Paris, France. International Union Against Tuberculosis and Lung Disease.