Public Health Action

VOL 2 NO 4 PUBLISHED 21 DECEMBER 2012

International Union Against Tuberculosis and Lung Disease
Health solutions for the poor

SHORT COMMUNICATION

Screening tuberculosis patients for diabetes mellitus in Fiji: notes from the field

S. Gounder,[1] A. D. Harries[2,3]

http://dx.doi.org/10.5588/pha.12.0058

Diabetes (DM) is a problem in Fiji and threatens tuberculosis (TB) control efforts. A review was conducted of all TB patients registered in Fiji in 2011 to assess routine practices of screening for DM. Of 221 TB patients, 138 (62%) had their DM status recorded in their case folders; 18 (13%) had a known history of DM. Random blood glucose (RBG) was performed in 91 (76%) of the remaining 120 patients: 47(52%) had RBG ⩾ 6.1 mmol/l, but only three were further investigated, of whom one was diagnosed with DM. There are deficiencies in screening TB patients for DM in Fiji, and improvements are needed.

There is good evidence to suggest that diabetes mellitus (DM) increases the risk of tuberculosis (TB).[1,2] DM patients with TB also experience worse treatment outcomes than patients without DM, with an increased risk of death and recurrent disease.[3] DM is a growing problem in Fiji; about 16% of the population have DM, but many cases are not diagnosed and treated.[4] Although Fiji is classified as a low TB burden country, this has become a matter of concern for the National Tuberculosis Programme (NTP), as DM may lead to an increase in TB case burden and hamper current TB control efforts.

When TB patients are registered in Fiji, they should be asked whether they have DM. For those with no known history of DM, random blood glucose (RBG) measurements should be performed, followed by confirmatory fasting blood glucose (FBG) measurements in patients whose RBG is above a certain threshold. It has been recommended that patients whose RBG is ⩾6.1 mmol/l be investigated further, as they are at high risk of having DM.[5] There has been no formal assessment in Fiji about whether these recommendations are adhered to. We therefore conducted a retrospective study to determine 1) what proportion of TB patients were recorded as having DM, and 2) whether RBG measurements had been performed and recorded along with the results.

METHODS

This was a cross-sectional study involving a review of patients' medical folders. Fiji (population approximately 837000) is an island nation in the South Pacific with 322 islands, of which 106 are permanently inhabited.[6]

The Fiji NTP was established in 1951 and adopted the DOTS strategy in 1997. There are three DOTS Centres, each in the three administrative divisions of the country, where TB patients are registered and receive the intensive phase of treatment for 2–3 months. According to international recommendations, DM status is supposed to be assessed and recorded in patient case folders during registration.[7] First, patients are asked if they are known to have DM. In those with no known history of DM, an RBG is conducted; if the RBG is ⩾6.1 mmol/l, an FBG is carried out. Patients who have FBG ⩾ 7.0 mmol/l are diagnosed as DM, and are referred for DM care.

All TB patients recorded in the TB patient registers in the three DOTS Centres from January to December 2011 were included in the study. The following data were collected from the patient folders into a structured questionnaire: age; sex; ethnicity; type of TB; DM status, if known; in those with no known DM, whether an RBG had been performed; the number with RBG ⩾ 6.1 mmol/l; and in these, whether an FBG had been performed and the result.

The data were collected from January to March 2012 and double-entered into EpiData, version 3.1 (EpiData Association, Odense, Denmark). The χ^2 test was used to assess differences in proportions between groups, with odds ratios (ORs) and 95% confidence intervals (CIs). Differences at the 5% level were regarded as significant.

Ethics approval was obtained from the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, the National Health Research Committee and the Fiji National Research Ethics Review Committee.

RESULTS

There were 221 TB patients, of whom 138 (62%) had their DM status recorded. Of these, 18 (13%) had a known history of DM (Table 1). The main observation was a significantly higher rate of DM in Indo-Fijians compared with indigenous Fijians (OR 7.0, 95%CI 2–24, $P < 0.001$), and the fact that the DM rate approached 50% in adults aged ⩾55 years.

Of 120 TB patients who were recorded as not having DM, 91 (76%) had their RBG measured; 47 (52%) had an RBG ⩾ 6.1 mmol/l. There were no differences in sex, age, ethnicity or type of TB (also stratified by sputum smear status) in the proportion of those with RBG performed or RBG ⩾ 6.1 mmol/l (Table 2). Three (6%) patients with RBG ⩾ 6.1 mmol/l had an FBG performed; one patient had FBG ⩾ 7mmol/l.

AFFILIATIONS
1 Fiji National Tuberculosis Programme, Suva, Fiji
2 International Union Against Tuberculosis and Lung Disease, Paris, France
3 London School of Hygiene & Tropical Medicine, London, UK

CORRESPONDENCE
Shakti Gounder
Fiji National Tuberculosis Programme
Ministry of Health
Suva, Fiji
Tel: (+679) 368 4333
e-mail: shaktigounder@gmail.com

ACKNOWLEDGEMENTS
This research was supported through an operational research course that was jointly developed and run by the Fiji National University; the Centre for Operational Research, International Union Against Tuberculosis and Lung Disease; the Operational Research Unit, Médecins Sans Frontières, Brussels; The University of Auckland, New Zealand; the Woolcock Institute of Medical Research, Sydney, Australia; and the Centre for International Child Health, The University of Melbourne, Melbourne, VIC, Australia. Funding for this course came from the Global Fund to Fight AIDS, Tuberculosis and Malaria, the International Union Against Tuberculosis and Lung Disease and the World Health Organization. Conflict of interest: none declared.

KEY WORDS
operational research; tuberculosis; diabetes mellitus; Fiji

Received 12 September 2012
Accepted 15 November 2012
First published online 12 December 2012

PHA 2012; 2(4): 145–147

TABLE 1 Known DM among TB patients in Fiji, 2011*

Characteristic	Total *n*	Known DM *n* (%)
All patients	138	18 (13)
Sex		
Male	74	10 (14)
Female	64	8 (13)
Age, years		
0–14	6	0
15–54	103	4 (4)
⩾55	29	14 (48)
Ethnicity		
Fijian	92	8 (9)
Indo-Fijian	25	10 (40)
Others	21	0
TB type		
Pulmonary TB	107	14 (13)
Extra-pulmonary TB	31	4 (13)

*Proportion of TB patients with DM whose DM status was recorded in the patient folder.
DM = diabetes mellitus; TB = tuberculosis.

TABLE 2 Screening of TB patients in Fiji with no known DM using RBG, 2011

Characteristic	Total *n*	RBG performed *n* (%)	RBG ⩾ 6.1 mmol/l *n* (%)
All patients	120	91 (76)	47 (52)
Sex			
Male	64	43 (67)	25 (58)
Female	56	48 (86)	22 (46)
Age, years			
0–14	6	3 (50)	2 (67)
15–54	99	76 (77)	38 (50)
⩾55	15	12 (80)	7 (58)
Ethnicity			
Fijian	84	62 (74)	34 (55)
Indo-Fijian	15	13 (87)	4 (31)
Others	21	16 (76)	9 (56)
TB type			
Pulmonary TB	93	73 (78)	37 (51)
Extra-pulmonary TB	27	18 (67)	10 (56)

TB = tuberculosis; DM = diabetes mellitus; RBG = random blood glucose.

DISCUSSION

This is the first study in Fiji looking at screening practices related to DM among TB patients; the study findings show deficiencies at every level. More than one third of patients had no record of any questions or investigations in the files. While three quarters of patients with no history of DM had an RBG performed, subsequent follow-up was poor and <10% of patients who should have had FBG measurements performed actually did so. The few results that were obtained suggest that DM is a problem, particularly among Indo-Fijians and among those aged ⩾55 years.

The strengths of this study are that all TB patients registered during a 1-year period were included, and the results are therefore representative of the national situation. Limitations relate to the operational nature of the study and the use of patient folders as the source of data.

International recommendations have been made about the need for bi-directional screening of DM and TB, particularly in high TB and DM burden countries.[7] However, published data about how this would best be implemented in routine practice at country level are scarce.[8] A recent report from China suggested that the incorporation of DM results into TB-DM registers that are linked to TB registers, combined with formal quarterly reports on numbers of patients screened for DM and numbers diagnosed with DM and referred for care, works well, and this could be a template for other countries to follow.[9]

In conclusion, this study shows that the routine practice of screening TB patients for DM in Fiji is suboptimal and needs to improve. A first important step will be a policy decision about incorporating screening results into TB registers and including the subsequent DM data in the quarterly reports, i.e., 'what gets measured gets done'. Screening for DM in TB patients should lead to better and earlier detection of DM, earlier and better treatment of DM (which might otherwise have gone unrecognised) and improved clinical outcomes of DM-TB patients on anti-tuberculosis treatment.

References

1 Jeon C Y, Murray M B. Diabetes mellitus increases the risk of active tuberculosis: a systematic review of 13 observational studies. PLoS Med 2008; 5: e152.
2 Stevenson C R, Critchley J A, Forouhi N G, et al. Diabetes and the risk of tuberculosis: a neglected threat to public health? Chronic Illness 2007; 3: 228–245.
3 Baker M A, Harries A D, Jeon C Y, et al. The impact of diabetes on tuberculosis treatment outcomes: a systematic review. BMC Med 2011; 9: 81.
4 Fiji Ministry of Health, Ministry of Health. Fiji Non-Communicable Diseases (NCD) Steps Survey 2002. Suva, Fiji: MoH, 2004.
5 World Health Organization, International Diabetes Federation. Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. Report of a WHO/IDF consultation. Geneva, Switzerland: WHO, 2006.
6 Fiji Island Bureau of Statistics. Fiji Population Census. Suva, Fiji: Bureau of Statistics, 2007.
7 World Health Organization/International Union Against Tuberculosis and Lung Disease. Provisional collaborative framework for care and control of tuberculosis and diabetes. WHO/HTM/TB/2011.15. Geneva, Switzerland: WHO, 2011.
8 Jeon C Y, Harries A D, Baker M A, et al. Bi-directional screening for tuberculosis and diabetes: a systematic review. Trop Med Int Health 2010; 15: 1300–1314.
9 Li L, Lin Y, Mi F, et al. Screening of patients with tuberculosis for diabetes mellitus in China. Trop Med Int Health 2012; 17: 1294–1301.

Le diabète (DM) est un problème à Fiji et menace les efforts de la lutte contre la tuberculose (TB). On a mené une revue de tous les patients tuberculeux enregistrés à Fiji en 2011 afin d'évaluer les pratiques de routine pour le dépistage du DM. Sur 221 patients TB, 138 (62%) avaient un statut de DM noté dans les dossiers médicaux, dont 18 (13%) avaient des antécédents connus de DM. On a réalisé un dosage du glucose sanguin à un moment quelconque (RBG) chez 91 (76%) des 120 patients enregistrés comme sans diabète ; chez 47 patients (52%) le RBG était ⩾ 6,1 mmol/l, mais des investigations ont été poursuivies chez trois seulement, avec un diagnostic de DM chez un des trois. A Fiji, il existe des déficiences dans le dépistage du diabète chez les patients TB, et des améliorations sont nécessaires.

La diabetes (DM) constituye un problema de salud en Fiji y plantea una amenaza a las iniciativas de control de la tuberculosis (TB). Se realizó un análisis de todos los pacientes con TB registrados en Fiji en el 2011, con el propósito de evaluar las prácticas corrientes de detección sistemática de la DM. De los 221 pacientes con TB, 138 (62%) contaban con un registro de su situación con respecto a la DM en la historia clínica y 18 (13%) presentaban antecedentes conocidos de la enfermedad. Se practicó una medición de la glucemia aleatoria (RBG) a 91 de los 120 pacientes restantes (76%); 47 de ellos (52%) presentaron RBG $\geqslant$ 6.1 mmol/l, pero solo en tres pacientes se continuó la evaluación y en uno de ellos se estableció el diagnóstico de DM. En Fiji, existen deficiencias en la detección sistemática de la DM en los pacientes con TB y es preciso aportar una solución.

Public Health Action (PHA) The voice for operational research.
Published by The Union (www.theunion.org), PHA provides a platform to fulfil its mission, 'Health solutions for the poor'. PHA publishes high-quality scientific research that provides new knowledge to improve the accessibility, equity, quality and efficiency of health systems and services.

e-ISSN 2220-8372
Editor-in-Chief: Donald A Enarson, MD, Canada
Contact: pha@theunion.org
PHA website: http://www.theunion.org/index.php/en/journals/pha
Article submission: http://mc.manuscriptcentral.com/pha