Tuberculosis in medical doctors – a study of personal experiences and attitudes

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Background. The concurrent TB and HIV epidemics in sub-Saharan Africa place all healthcare workers (HCWs) at increased risk of exposure to *Mycobacterium tuberculosis*.
Aim. This study explores personal experiences, attitudes and perceptions of medical doctors following treatment for TB within the healthcare system.
Method. Sixty-two medical doctors who were diagnosed with and treated for TB during 2007 - 2009 agreed to participate and complete a semi-structured questionnaire.
Results. The response rate was 64.5% (*N*=40). The mean age of participants was 33.7 years (standard deviation ±10.6). A correct diagnosis of TB was made within 7 days of clinical presentation in 20% of participants, and was delayed beyond 3 weeks in 52.5%. Non-routine special investigations and procedures were performed in 26 participants. Complications following invasive procedures were reported by 8 participants. Multi-drug resistant TB (MDR-TB) was diagnosed in 4 participants. Nineteen considered defaulting on their treatment because of drug side-effects. The majority (*n*=36) expressed concerns regarding lack of infection control at the workplace, delays in TB diagnosis and negative attitudes of senior medical colleagues and administrators. Ninety per cent of participants indicated that their personal illness experiences had positively changed their professional approach to patients in their current practice.
Conclusion. The inappropriate delays in diagnosis in a large number of participants, coupled with a number of negative personal perceptions towards their treatment, are cause for concern. The results further amplify the need for improved educational and awareness programmes among all healthcare personnel (including hospital administrators), adherence to national health guidelines, effective infection control measures, pre- and post-employment screening in all HCWs, and changes in attitudes on the part of senior medical colleagues and administrators.

Tuberculosis (TB) has reached epidemic proportions in sub-Saharan Africa, the incidence in South Africa (SA) having risen from 556 cases per 100 000 population in 2002 to 981 per 100 000 population in 2010.[1] This epidemic is fuelled by the HIV epidemic.[1-3] SA is ranked among the top 3 TB-incidence countries in the world, with an extremely high drug resistance rate (both multi-drug and extensively drug-resistant) despite being one of the most resourced countries in Africa. Occupational exposure to TB constitutes a major health hazard for all healthcare workers (HCWs) throughout the world, and especially in low-income and resource-constrained countries and settings.[4,5] A study of state hospital records in KwaZulu-Natal (KZN) Province for the period January 1999 - June 2004 showed the 'incidence of TB in HCWs to be alarmingly high (mean incidence being 1 133 per 100 000) particularly in the younger age groups (25 - 29 years)' with the authors concluding that poor treatment outcomes were cause for concern.[6]

The risk of developing TB among HCWs depends on factors such as occupational category, age and use of TB infection control measures in the workplace.[7] While a number of general population studies have been conducted globally on the attitudes and psychological impact of contacting TB,[4,8-10] little or no work has been done among HCWs

generally, and particularly among doctors who are at greater risk of exposure than the general population. A qualitative study on the impact of drug-resistant TB on 5 medical doctors in SA found that 4 of them experienced adverse effects owing to medication, which in some continued for several years after treatment was completed.[2] This study furthermore documented prolonged morbidity, psychological disturbances, poor infection control and support structures in the working environment, and doctors leaving the profession.

Our study investigated the personal experiences of medical doctors treated for TB, and their attitudes towards their diagnosis and management.

Methods

This descriptive cross-sectional study was conducted in 2010 among medical doctors working in the public and private sectors in KZN Province, SA, who had been diagnosed and treated for TB during 2007 - 2009. Institutional ethical approval was granted by the University of KwaZulu-Natal (reference BF 097/09) and the KZN Provincial Department of Health.

Relevant information concerning the study was provided at meetings of representatives of medical doctor groups held at 3 major

centres in KZN (Durban, Empangeni and Pietermaritzburg) during 2010. All medical doctors who had been diagnosed and treated for TB during 2007 - 2009 were invited to participate. Additionally, the study was advertised via the secretariat of each medical group. Those interested in participating were requested to contact the lead researcher (AN). Sixty-two medical doctors working in these 3 centres responded to the advertisements and volunteered to participate. Questionnaires were then distributed to all respondents on receipt of written informed consent.

Data were collected using a self-administered semi-structured questionnaire comprising both open and closed-ended questions. The questionnaire was piloted with 5 medical doctors who had TB prior to 2007, and modified prior to distribution to participants. Confidentiality and anonymity were maintained at all times, and participants were required to return the questionnaires without identifiers.

Data were analysed using Statistical Software Package for the Social Sciences (SPSS3), version 18. Frequencies and percentages (including mean and standard deviation where appropriate) were calculated to describe the categorical variables; statistical significance of associations between variables was assessed using Pearson's chi-square tests.

Results

Forty of the 62 respondents completed and returned the questionnaires – a response rate of 64.5%. The study sample comprised 21 men and 19 women. The mean age of participants was 33.67±10.63 years. The socio-demographic profiles of all participants are shown in Table 1. There were 34 Indians, 3 blacks and 3 whites among the participants. The majority (n=38) were employed in state hospitals, of whom 27 (67.5%) were employed in specialist designated regional or tertiary state sectors, and the remainder (27.5%) in primary care clinics and district hospital facilities. Two were self-employed and in private general practice. Sixty-five per cent had worked in medical disciplines and 27.5% in a surgical discipline in public hospitals prior to being diagnosed with TB. Only 2 of the participants worked either in a TB clinic or TB in-patient ward. Ten participants were still receiving TB treatment at the conclusion of the study.

There were no statistically significant gender differences for any of the variables studied. The most common presenting symptoms and the investigations performed at initial presentation in public and/or private hospitals are listed in Tables 1 and 2 respectively.

Sputum microscopy was requested for 28 (70%) participants, and chest radiographs performed on 38 (95.0%) by the relevant occupational health clinics at the site of employment in the public health sector. Fifteen participants (37.5%) self-referred to specialist physicians in the private sector and underwent chest computerised axial tomography (CAT) scans. Other investigations or diagnostic procedures undertaken in the private sector included upper oesophagoscopy (in a participant complaining of dysphagia), lung function testing, bronchoscopy, tissue biopsy (of pleura, lymph node and lung), magnetic resonance imaging (MRI) scans and CAT angiograms.

Eight (20.0%) of the participants reported the development of complications as a result of diagnostic procedures (Table 2). The complications were haemoptysis and pleuritic chest pain following bronchoscopy, cellulitis at the biopsy site of the lesion, development of a chest wall abscess at the biopsy site, a chronic draining sinus from a lymph node biopsy site, and injury to the neurovascular bundle following insertion of an intercostal chest drain and a pleural biopsy.

Table 1. Socio-demographic profile and presenting symptoms (n=40)

Variable	Total	
	n	%
Number of participants, n	40	100.0
Gender, n		
Male	21	52.5
Female	19	47.5
Age (years), n		
3 - 30	21	52.5
1 - 40	13	32.5
41 - 50	1	2.5
51 - 60	5	12.5
Race, n		
Black	3	7.5
Indian	34	85.0
White	3	7.5
Current employment, n		
Public sector: PHC and district hospital	11	27.5
Specialty level (levels 2 - 4)	27	67.5
Private sector (self-employed)	2	5.0
Discipline ever worked in prior to diagnosis, n		
Medical	29	72.5
Surgical	8	20.0
General practice (self-employed)	2	5.0
Non-disclosure	1	2.5
Final diagnosis, n		
Pulmonary TB	32	80.0
MDR-TB (pulmonary)	4	10.0
Extra-pulmonary TB	8	20.0
Baseline presenting symptoms, n		
Malaise	22	55.0
Night sweats	21	52.5
Cough	19	47.5
Weight loss	20	50.0
Chest pain	14	35.0
Lymphadenopathy	12	30.0
Fever	9	22.5
Other symptoms	25	62.5

Thirty-two participants (80.0%) were finally diagnosed as having pulmonary TB, 4 (10.0%) of whom were found to have multi-drug resistant TB. The remaining 8 participants were diagnosed with extra-pulmonary TB (Table 1).

In only 52.5% (n=21) (Table 3) of participants was TB diagnosed on initial presentation. In 20.0% (n=8), the diagnosis was established within 7 days of seeking treatment (Table 4). Eleven participants were diagnosed between weeks 2 and 3, and 21 (52.5%) beyond day 21. Reasons for delays in diagnosis are listed in Table 3. Thirty-five

Table 2. Initial investigations and complications

Investigations	Participants	
	n	*%*
Chest X-ray	38	95.0
Sputum		
Microscopy	28	70.0
Culture	23	57.5
Sensitivity	17	42.5
CAT scan (chest)	15	37.5
Tissue biopsy		
Microscopy	14	35.0
Culture	9	22.5
Pleural fluid		
Chemistry	8	20.0
Microscopy	7	17.5
Culture	7	17.5
Quantiferon Gold in-tube test	3	7.5
Other investigations	8	20.0
Complications as a result of procedures conducted	8	20.0

Table 4. Side-effects of prescribed medications

Side-effect	Total	
	n	*%*
Abdominal pain	10	25.0
Arthralgia	5	12.5
Diarrhoea	5	12.5
Dizziness	1	2.5
Drowsiness	1	2.5
Gout	1	2.5
Headache	1	2.5
Hepatitis	3	7.5
Insomnia	2	5.0
Malaise	9	22.5
Metallic taste	2	5.0
Myopathy	2	5.0
Nausea, vomiting	21	52.5
Peripheral neuropathy	7	17.5
Photophobia	2	5.0
Skin rash	7	17.5

Table 3. Time lag from initial presentation to TB diagnosis

	Participants	
	n	*%*
Time delay to TB diagnosis (days)		
<8	8	20.0
8 - 21	11	27.5
22 - 59	21	52.5
Initial diagnosis (TB)		
Correct	21	52.5
Wrong	19	47.5
Perceived cause of delay in diagnosis		
Inappropriate help-seeking behaviour	5	12.5
Healthcare provider issues	8	20.0

per cent (14) of all participants suggested that the delays in diagnosis were inappropriate, further analysis revealing that 5 participants (12.5%) admitted to their own delayed and/or inappropriate health-seeking behaviour. Eight participants (20.0%) felt that their caregiver had either delayed or omitted investigation. Of the 40 participants, 19 were initially incorrectly diagnosed (Table 3).

A total of 84 iatrogenic side-effects (Table 4) were experienced by 82.5% (*n*=33) of the participants. Nine participants who developed severe iatrogenic side-effects self-medicated with homeopathic and complementary therapy while on concurrent anti-TB therapy.

Participants were also requested to indicate their views on 6 leading statements based on a Likert scale relating to their diagnosis, investigations and treatment (Table 5). A number of participants agreed that medical doctors received preferential consideration for specialised diagnostic procedures (*n*=30 (75%)), and also that they generally received preferential treatment (*n*=18 (45%)), compared with the rest of the population. The majority (*n*=36 (90%)) agreed with the statement that their personal experiences as patients with TB

had influenced them to modify their attitudes and clinical approaches to their current patients, including becoming more empathic towards their patients.

One participant stated that she regretted choosing clinical medicine as a career option, and has since found employment elsewhere in a laboratory facility without patient contact to minimise further risk. Another expressed similar feelings and stated that he was treated inappropriately by his work colleagues during his illness, being criticised for taking sick leave and required to make up lost work-hours. This sentiment was echoed by other participants who reported their belief that senior medical supervisors considered that sick leave was a privilege and not an entitlement. One participant complained that his confidentiality was not maintained; he subsequently sought employment without patient contact.

One participant felt 'angry' when having to treat patients who were infected with TB and HIV and admitted to feelings of resentment towards them as he felt they were 'responsible' for his illness. 'Having TB has been one of the most debilitating experiences of my life,' expressed one of the participants. Another participant lamented the attitudes of other colleagues and said, '... our task as doctors is to assist with healing others. It hurts when our own well-being is jeopardised through an illness (that we have contracted in trying to provide a service to others), and our own colleagues and our management show an uncaring attitude towards us!'

Discussion

The present study is the first in SA, with its high TB and HIV burden, to report the experiences attitudes and perceptions of medical doctors (in the healthcare system) who contracted TB and their attitudes and perceptions towards their illness. The study has shown that, despite their accessing appropriate occupational health clinics, the diagnosis of TB was delayed beyond day 8 in the majority, and that they received sub-optimal TB care compared with national and international treatment guidelines.[11]

Table 5. Reflective responses on diagnosis and treatment

Statement	Strongly disagree n	Disagree n	Neutral n	Agree n	Strongly agree n
Found period of treatment difficult to endure	4	4	5	20	7
Considered defaulting on pharmacotherapy	17	9	1	10	3
I modified my pharmacotherapy to suit my personal needs	14	15	0	10	1
Medical doctors are more likely to have access to specialised diagnostic procedures than the rest of the population	1	8	1	18	12
Medical doctors are given preferential medical treatment	2	11	9	14	4
Personal experience has changed my approach to patients	0	1	3	24	12

Many of our study participants were in the younger age group and employed within clinical departments in the public healthcare system before seeking help for their illness. Contrary to expectation, the overwhelming majority did not work in TB wards or TB clinics. It is probable that they acquired TB from patients with whom they were in close clinical contact, given that the majority of patients with TB usually first access general medical departments where doctors and nurses are the primary care givers.[2,6,12]

Our study found, surprisingly, that a large number of doctors had not taken seriously the cluster of symptoms that included cough and night sweats (that are generally accepted as being suggestive of TB infection), so delaying diagnosis and definitive treatment. However, the majority of participants in this study presented with nonspecific symptoms and signs, and therefore would have found it difficult to differentiate these from work-related fatigue or other mild illnesses. As one participant stated, 'I neglected the symptoms due to the pressures of work … stress, physical exhaustion, 10 - 12 calls per month, sleep deprivation and inappropriate diet.' Moreover, a few participants indicated that 'many doctors may be reluctant to admit that they are ill and may be especially unwilling to acknowledge that their ill health is affecting their performance at work.' Fear of stigmatisation in social and professional circles, which resulted in delayed help-seeking behaviour, have also been reported.[13] The World Health Organization identifies two main categories, which cause delay from onset of symptoms to diagnosis of TB, as patient delays and health system delays.[14] It has been recommended that the time elapsing between the patient being seen in the health care system and diagnosis should not exceed 24 hours.[15] In our study, multiple health system problems such as failure to adhere to standard treatment guidelines by clinical staff, delayed laboratory confirmation of tests, incorrect diagnosis and failure to treat empirically following clinical presentation, coupled with patient factors already described, contributed to delays exceeding 3 weeks in diagnosis of the disease in the majority (about 58%) of our participants. Similar delays have been reported in other studies involving the general population.[16,17]

If misdiagnosis, long delays in making the correct diagnosis and complications owing to procedures are experienced by medical doctors akin to those described in this study, the situation may be expected to be even worse among the general population. Furthermore, many participants complained of lack of infection control measures in their workplaces, including simple cost-effective measures that would have been protective. Herein may

lie, in part, an explanation of why SA has such an unmanageable TB epidemic.

Not surprisingly, most doctors received preferential care by fellow medical colleagues, and particularly specialist physicians, to whom they were referred or self-referred. Despite this, their care was sub-optimal when compared with the standard guidelines.[11]

The paucity of studies related to illness and management perceptions, stigmatisation and denialism among medical doctors infected with TB has made comparisons difficult. However, studies conducted among the general population on personal experiences following TB infection reveal similar findings. Denial by patients of having contracted or their suffering from TB has been an ongoing problem.[8,18] TB-related stigma has been shown to worsen the quality of life of patients, affecting their health and health-seeking behaviour.[19] Certain social consequences (unemployment, homelessness, imprisonment and poverty) and psychological effects (low morale, depressed mood, mood swings and low confidence in medical staff) all potentially account for poor adherence to treatment and inappropriate help-seeking behaviour.[18,20] Patients who were not adequately educated about the cause of TB, and who felt embarrassed about having contracted the disease, combined with negative attitudes on the part of healthcare staff, discouraged them from seeking early treatment.[10]

Tests such as chest X-rays and sputum analysis, which are accepted to be part of the standard care of practice in the national healthcare system,[3,11] were not conducted in all participants in our study. It is possible that participants who could not produce sputum were sent for alternative tests. Because these tests were then found to be negative in the majority of participants, caregivers might have opted for a variety of costly investigations such as Quantiferon Gold in-tube test, chest CT scans (33.5%), bronchoscopy, mediastinoscopy etc., which are not normally available to the general public. The Quantiferon Gold in-tube test has been found to have a low sensitivity in the diagnosis of active TB.[21] A number of participants in this study agreed that medical doctors are generally given preferential treatment by their colleagues and are more likely to access specialised levels of care than the general population, and that the search for a diagnosis is amplified when the patient is a medical doctor. However, the low sensitivity and specificity of many of the tests appears not to have been taken into account.

Strict adherence to anti-TB therapy forms the cornerstone of the nationally accepted clinical guidelines in TB management.[3] Clinicians are expected to spend a significant amount of time counselling patients on adherence. It is therefore disconcerting that a large number of

participants displayed varying responses and attitudes to statements relating to adherence. Thirteen (32.5%) participants considered defaulting on their treatment, and a further 11 (27.5%) modified their therapy to suit their personal needs. Twenty-seven (67.5%) participants admitted to difficulty in enduring their treatment, perhaps because of side-effects commonly associated with anti-TB drugs, and because of concomitant high stress levels and varying levels of depression. Risk factors for defaulting on treatment have been identified in a number of other studies,[22-24] and include side-effects of medication and not being given a choice of treating doctor; long waiting times and problems with health facilities were considered to be additional potential risk factors for non-adherence to therapy.

This study produced the positive finding that most participants were humbled by their own experiences and since became more patient-centred in their consultations. Similar findings have been reported in other studies, where medical doctors felt that their personal experiences have helped them to better empathise and communicate with patients.[25] However, a minority of participants felt that the high burden of disease and increased burden of care by a limited and constrained medical workforce militated against a change in professional behaviour towards patients.

Study limitations

Notwithstanding the relatively good response rate of 64.5% shown in our study,[26] major shortcomings in this study included the relatively small sample size and selection bias resulting in a 'skewed' sample. The low sample size might have been influenced by several factors, e.g. restriction of the study to recent cases only, and fears of stigmatisation and victimisation. Additionally, only a minority (30.8%) of doctors from the primary healthcare sector of the public healthcare system volunteered to participate. Our data may therefore not be representative of the actual prevailing burden of TB among medical doctors working in primary care and rural settings. Furthermore, sample selection bias caused by recruitment of participants from selected areas could have skewed the demographic data.

Shortcomings were also identified in the design of the questionnaire used in the study; these included failure to explore certain demographic and illness data such as urban v. rural setting, access to specialist care in public or private facilities, and time lag from symptoms to help-seeking behaviour.

The results of this study, therefore, cannot be generalised to the broader population of medical doctors in SA, but do serve to alert colleagues to the real risks of contracting TB in the course of healthcare work.

Conclusion

The negative effect of TB infection on medical doctors is a cause for concern and may mirror a sub-optimal standard of care delivered to patients. The excessive delays before diagnosis in a large number of study participants, coupled with a number of negative personal perceptions about TB diagnosis and treatment, are disconcerting. This study emphasises the need for improved educational and awareness programmes for all healthcare personnel, including hospital administrators, and changes in attitudes on the part of senior medical colleagues and administrators towards medical doctors with TB. There is a need also for strict adherence to national treatment guidelines, and effective infection control measures. A case can be made for pre- and post-employment screening of all HCWs.

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