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Review Article

Socio-demographic factors affecting tuberculosis diagnostic test seeking behavior in Pakistan: a review

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Abstract

Role of different social and demographic factors affecting the diagnostic seeking behaviors of tuberculosis in Pakistan is described in this review. The articles addressing the diagnostic test seeking behaviors of tuberculosis were approached using the Medline, Pub med and Google Scholar for the period of review extending from 1998 to 2013. Tuberculosis test seeking behavior showed variations with patients' perception about disease, age, gender, socio-economic level, education, location, health insurance and paying capacity and the presence or absence of other chronic diseases like HIV and diabetes mellitus. Conclusively different factors like gender, education, age, socioeconomic status and location (urban settings) affected the diagnostic test seeking behavior of patients in Pakistan resulting in the delayed diagnosis and ultimately causing an increase in the incidence of disease. These factors need to be addressed to decrease the disease burden of TB in Pakistan.

Key words: Tuberculosis, Pakistan, diagnosis of TB, factors affecting TB diagnosis

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INTRODUCTION

Tuberculosis, a communicable disease, is one of the leading causes of mortality in the world. One-third population of the world is currently infected with the tuberculosis bacillus; out of those 5-10% individuals develops disease at some time during their life. Although tuberculosis exists in all parts of the world yet it is concentrated at its maximum in developing countries which shares 90% of the global tuberculosis burden (Onyango, 2011). In Pakistan, tuberculosis is endemic and is one of the most common causes of morbidity and mortality from communicable diseases. In 2011 only, 408,870 people in Pakistan developed tuberculosis, while the total population of the country was 177 million at that time. Out of these 408,870 incident cases of tuberculosis, only 270,394 were notified as tuberculosis positive with case notification rate of 66%. This shows that 138,476 (34% of total tuberculosis patients) developed the diseases during the year but did not participated in screening program hence remained undiagnosed (WHO, 2013). Undiagnosed as well as lately diagnosed tuberculosis is associated with rapid communication of disease in community, high mortality and longtime morbidity among the patients. It is important to note that in developing countries like Pakistan, where free of cost diagnostic and treatment services are being provided by National TB Control Program along with National and International Partners under DOTS strategy, low case notification rate for tuberculosis need to be evaluated in behavioral context. The assessment of behavioral factors including social, demographic, cultural and psychological would spotlight perceived barriers in diagnostic test seeking behavior of tuberculosis suspects.

This paper reviews the demographic and cultural elements of the society including age, gender, distance from health facility, socio-economic status (occupation, education and income) paying capacity, health insurance and cultural perception about the disease which influence the mentioned behavior. The paper would pave the way for designing public health

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interventions, ultimately leading to focused behavior change communication that has the potential to impede the progression and spread of disease. About 1000 abstracts and articles addressing the diagnostic test seeking behaviors of tuberculosis were identified using the Medline, Pubmed and Google Scholar with the period of review extending from 1998 to 2013. Only those abstracts and articles which were relevant to the contextual settings of Pakistan were included in the study. Articles published before 1998 and irrelevant to the contextual settings of Pakistan were excluded from the study.

Steps involved in diagnosis of tuberculosis are critical in determining the test seeking behaviorof the tuberculosis suspected cases. In Pakistan, on the basis of history and physical examination, high risk patients for tuberculosis are identified. A number of diagnostic tests are used to confirm tuberculosis. These include chest X-ray, sputum smear microscopy, Mantoux tuberculin skin test, sputum for culture, and polymerase chain reaction (PCR).

Among these, chest X ray is not used solely for confirmation of diagnosis, sputum smear microscopy needs quality control and assurance in resource deprived setting like Pakistan where the test is performed by technicians with minimal trainings (Van Deun and Portaels, 1998), Mantoux test often gives inaccurate results either due to interpretation errors of Mantoux tuberculin skin reaction (Kendig *et al*., 1998) or if patient is BCG vaccinated at birth, sputum for culture often provides definitive tuberculosis diagnosis but result is obtainable in 4-8 weeks with solid culture media and in 1-2 weeks with liquid culture (NTP, 2013) and PCR with93% sensitivity is an expansive test.

From studies in developing world, it is evident that tuberculosis test seeking behavior shows variations with patients' perception about disease (Qureshi *et al*., 2008), age, gender, socio-economic level, education level, location, health insurance and paying capacity (Rubel *et al*., 1992; Shaikh *et al*., 2005) and the presence or absence of other chronic diseases like HIV and diabetes mellitus.

A study conducted in Eastern Mediterranean region in 2003-2004 identified factors associated with delay in diagnosis of tuberculosis in 7 high burden disease countries. This study explained that in Pakistan the test seeking behavior is greatly influenced by socioeconomic level (occupation, income, education), perception and knowledge about the disease, age, sex, severity of disease and distance from health service units (Sreeramareddy *et al*., 2009; Storla *et al*., 2009; Ngangro *et al*., 2012).

Comorbidity

Diagnostic test seeking behavior of a healthy individual is different from the person in immune compromised state. A study conducted in Thailand has shown that HIV infected people show less patient's delay in diagnostic test seeking and hence diagnosed early in the course of tuberculosis.

This study included all newly diagnosed tuberculosis patients aged over 15 years (n=557) in a health care facility. Patients with known HIV have shown a minimum median delay in participation for diagnostic test, whereas HIV negative as well as people with unknown HIV status had more patient delay for the diagnosis of tuberculosis (Ngamvithayapong *et al*., 2001). Another study in Thailand found that as weight loss, cough and fever are also seen in HIV patients other than tuberculosis, thereby in HIV endemic areas fear of HIV hinders the test seeking behavior of tuberculosis patients (Ngamvithayapong *et al*., 2000).

Education Level

Education level poses a serious consequence on diagnosis seeking behavior. People who are less educated show a lower test seeking response for tuberculosis after the onset of related sign and symptom (Okita *et al*., 2005). In Peruvian Amazon, 108 newly diagnosed patients of tuberculosis were assessed for delays in health seeking behavior. There was a median delay of 61 days from the onset of chest symptom to diagnostic testing for tuberculosis. Education of patients less than secondary level was found to be related with 44% longer delay in health seeking behavior (Ford *et al*., 2009).

In China, a study revealed that less educated people were less likely to participate in diagnostic screening (Zhang *et al*., 2007). Lack of awareness of tuberculosis was responsible for delay in care seeking behavior in 40% of the participants in a research carried out in India (Rajeswari *et al*., 2002). In Pakistan, inadequate knowledge regarding the disease has indicated 1.13-fold increased risk for delay in diagnosis of disease. In addition the same study revealed that illiterate people have shown 2.6 folds more delay in diagnosis seeking behavior than educated (University graduate) (WHO, 2013).

Gender

Diagnosis seeking behavior is associated with sex of patient. From 10 sub districts of Bangladesh, 1000 newly diagnosed patients of tuberculosis were interviewed (500 men, 500 women). Women were found to have longer mean and median diagnostic delays (51.9, 50.0 days respectively) than men having mean and median diagnostic delays of 48.7 and 42.0 days respectively. It was also determined that in such cases delays in diagnosis of TB were more likely to be caused by patient's health seeking behavior than that of health provision system (WhO, 2013). Another research among rural Vietnamese involved 559 adults (259 males, 300 Females) who had history of cough for more than 3 weeks. It was found out that males had slightly higher knowledge score than females regarding causes, transmission, symptoms and curability of tuberculosis. The better knowledge was significantly related to higher diagnostic testing seeking behavior among male patients (Hoa, *et al*., 2003). Similarly in Pakistan, the delay in tuberculosis diagnosis is slightly more in females than males with odd ratio of delay is 1.03 (Ngamvithayapong *et al*., 2000).

Marital status

Marital status is also considered a factor associated with treatment seeking behavior. From the seven country studies, it was found out that in Pakistan the maximum delay is seen in widows/divorced which is 7.6 times more than married, whereas in Yamen the delay in diagnosis seeking is less in widow/divorced than in married. In Pakistan the minimum delay is seen in married people (Ngamvithayapong, *et al*., 2000).

Socioeconomic Status

Analysis of socioeconomic indicators helps in determining the health seeking behavior of a community. Patients without health insurance (unprivileged) show a delay in the diagnosis of tuberculosis. The 614 randomly selected respondents were assessed for their tuberculosis diagnosis seeking behavior in three resource deprived villages of China. Up to 70% of the respondents were unable to bear the cost of diagnosis and treatment (Ngangro *et al*., 2012). People with limited affordability for their diagnostic testing and treatment show delays in participation in screening for tuberculosis (WHO, 2013; Van Deun and Portaels, 1998; Kendig *et al*., 1998). In Pakistan, general belief that services provided at low cost are not sufficient, hence they try to seek care from private healthcare facilities which increases the risk of delay upto 4-fold in diagnosis and treatment (Ngamvithayapong, *et al*., 2000).

Rural vs. Urban

Although amultivariate analysis revealed that more urban respondents (93%) try to do self-medication for their symptoms than those of rural respondents (80.6%). However, for tuberculosis, people living in rural areas show more delays than urban in contracting healthcare facility for their diagnosis and care (cheng *et al*., 2005; Lawn, *et al*., 1998; Lienhardt *et al*., 2001). In Pakistan, the maximum delay is seen for people living in suburbs, which is 2.5 times more than for patients living in cities. Contrary to finding in other developing countries, in Pakistan the delay in diagnosis seeking is less (0.83 times) in villages as compared to cities (Ngamvithayapong *et al*., 2000).

Age

Age is also a determinant of delays in health seeking behavior. Three age groups (15-30 years, 31-45 Years, and 45-65) were assessed for treatment seeking behavior in a research carried out in China. It was found out that people who are 46-65 years of age participate more in screening for tuberculosis than people in other age groups (Zhang *et al*., 2007). Another study in China showed that elderly people above 65 are less likely to participate in tuberculosis screening than young (Ngangro *et al*., 2012). Older age of females is also associated with delay in participation of screening test for tuberculosis (Okita, 2005; Balasubramanian *et al*., 2004). In Pakistan, patients more than 35 years of age have shown less delay than patients who are less than 35 years of age.

Distance from health care facility

Distance from health care facility also determines the rate of participation in screening programs for diagnosis of tuberculosis (Demissie *et al*., 2002; Yimer *et al*., 2005; Steen and Mazonde, 1998; Zerbini *et al*., 2008). In India 531 people were interviewed to find out the cause of delay in health seeking for tuberculosis. It was found out that people living far from healthcare facility show a delay (P =0.04) in

health care seeking behavior and tend to do self-medication (Ngamvithayapong *et al*., 2001).

Public awareness about tuberculosis

Lack of community awareness about the sign and symptoms of tuberculosis also found to contribute in delayed health seeking behavior of patients. Studies conducted in hospital setting at Nigeria and Malaysia found that patients' knowledge about the disease determines how quickly he/she would contact health facility for tuberculosis diagnostic screening (Liam and Tang, 1997; Odusanya and Babafemi, 2004; Thomas, 2002). Health seeking behavior of community members, determines prognosis and control of disease in that specific region. It is estimated that a tuberculosis patient can infect on average 10 contacts in a year and more than 20 in the whole course of life if remained untreated. Early diagnosis not only helps in treatment of the disease, but also reduces chances of long term morbidity and mortality and thus proves effective in reducing transmission and spread of the disease.

Conclusion

In Pakistan, patient's delay in diagnostic test seeking for tuberculosis is associated with gender(more in females),education (more in illiterate patients), age (more in patients less than 35),socioeconomic status (more in economically deprived), location (more in people living in suburbs) and knowledge/perception about the disease. The Socio-demographic factors, impede case detection and notification of tuberculosis in Pakistan and therefore, should be given prime importance while designing health care intervention to reduce burden of disease. It is also important to note the delay in diagnostic seeking amongst the female population, in part in attributable to their less education level and myth that the disease is incurable and if they (females) are diagnosed positively this will create a hindrance for them in getting married. Conclusively, public awareness programmes about the importance of diagnosis for proper treatment of the disease are need of the day.

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