Original article

ADDITIONAL YIELD OF ACTIVE CASE FINDING THROUGH HOUSE HOLD SURVEY IN SELECTED DISTRICT OF KABUL, AFGHANISTAN, 2018

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ABSTRACT

Every year, 10.4 million people get sick with Tuberculosis (TB) and 40 percent of them do not receive treatment care - they are "missed" to identify by the health systems. Missing TB cases is major challenge in fighting the disease; pose a serious threat to global health security. As per World Health organization estimation, in 2018, Afghanistan missed 27 percent TB case notification. Thus we conducted an active case finding through house hold survey from June – November, 2018 in Kabul city, districts of Afghanistan.

This descriptive cross sectional study included all the residence of 21 sub-districts in Kabul City Afghanistan. After obtaining written consent, data was collected using a structured questionnaire from all presumptive TB cases. Sputum was collected from eligible participants and tested for AFB, Gene-Xpart and Chest X-ray was done. Standard test algorithm and case categorization was done according to WHO recommendations. Descriptive analysis of demographic, clinical and laboratory data was done.

A total of 22,596 participants were included and among them 6740 were eligible. Among them 1614 (24.3%) individuals were screened positive to have presumptive TB and 105 (6.5%) had laboratory confirmed TB. Thus the case notification rate was 465 in 100,000 populations. Among the presumptive TB cases, mean age was 38.6 + 18.5 years; 74% were female; 72% were housewives/unemployed; 2.6% were smokers.

The case notification rate and the point prevalence showed increase numbers than the actual reports by the Afghanistan National TB program, which signifies the program was missing significant numbers of TB cases. Hence active TB case finding might be an effective approach in terms of case notification in Afghanistan. We recommend extending active community TB surveillance of the country.

Key words: Afghanistan, Tuberculosis, Prevalence survey, Household surveillance

INTRODUCTION

Worldwide, Tuberculosis (TB) is one of the top 10 causes of death and the leading cause from a single infectious agent. Millions of people continue to fall sick with TB each year. Globally, an estimated 10.0 million people fell ill with TB in 2018(1). There were an estimated 1.2 million (range, 1.1–1.3 million) TB deaths among HIV-negative people in 2018 (a 27% reduction from 1.7 million in 2000), and an additional 251 000 deaths among HIV positive people (a 60% reduction from 620 000 in 2000). TB affects people of both sexes in all age groups but the highest burden is in men (aged 15 years and over), who accounted for 57%

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of all TB cases in 2018. By comparison, women accounted for 32% and children (under 15 years of age) for 11%. Among all TB cases, 8.6% were people living with HIV (PLHIV).TBis an infectious disease caused by the bacterium Mycobacterium tuberculosis. Pulmonary TB is the most common form, caused by the inhalation of the bacterium[2]. About 10 million new cases of TB occur globally each year, 70% of new cases are aged between 15 and 59 years and there are about 3 million deaths[3]. TB is responsible for the second most number of deaths worldwide due to a single infectious agent, first being HIV/AIDS [4].The Low and middle income countries bear 95% of the total burden of deaths. And in these countries TB is among the top three causes of deaths. Tuberculosis is the leading cause of mortality of HIV infected patients; resulting in one fifth of all deaths[4]. A TB patient can infect up to 10 to 15 other people in close contact within one year. Two thirds of people gotten ill with TB will die within a year if not properly treated [4]. Though TB strikes in every part of the world, the largest number of new tuberculosis cases is from Asia; accounting for 60% of new cases globally [4].

Epidemiology of TB in Afghanistan

TB is a major health problem in Afghanistan, causing about 10,000 deaths per year [5]. A number of factors, including on going conflict, make it difficult for health services to reach many parts of the country. Despite these challenges, the National Tuberculosis Program (NTP) has chosen to address the problem with interventions that are proving successful. In 10 provinces, the NTP has started active case finding among targeted, previously underserved populations. Prompt case finding is an important pillar of global tuberculosis (TB) control[6]. In 2018, WHO estimated approximately 67,000 (CI: 40,000 - 88000) all types of TB cases with incidence rate of 189 per 100,000 population. Estimated mortality in 2018 was 10000 with the rate of 29 per 100000 populations. Also, cohort of 2017 shows treatment success rate for all TB cases of 90% and case notification rate was 154 per 100000 populations in 2018. Total 48,800 TB cases were detected in 2018 (highest annual TB case notification so far in last decade). The progress is commendable because in 2001 only 9,581 cases were detected and from that point onwards, the trends shows increasing pattern except in 2008 and 2009 where a slight decline was seen in notified numbers as compared to previous year (2007). From 2010 onward, again the trends are upward [7].

In Afghanistan, TB case finding is mainly done by sputum examination of symptomatic patients who attend various types of health institutes (i.e. passive case detection). Delays in diagnosis through passive case detection have been associated with patient- and provider-related factors [8, 9]. Most studies on case finding have investigated risk factors associated with delay in diagnosis of TB patients found through passive case detection [10, 11]. Few studies have compared TB patients found through passive case detection with those identified through prevalence surveys or other active case finding efforts. Minimizing the time needed for case detection should be a key consideration for health planners in designing an effective TB control program. Understanding the barriers to care seeking is important in designing appropriate intervention to maximize the care seeking [12].

In many SAARC Countries including Afghanistan, there is a big difference between estimated number of TB cases and actual number of cases. There are many risk factors present in Afghanistan namely, ongoing conflict, poverty, overcrowding, smoking, drug addict and poor literacy etc. Even though these risk factors are abundant in Afghanistan case detection rates of tuberculosis remains low. We do not know whether TB presumptive cases are hidden in this area. According WHO estimation (2019) NTP Afghanistan will notify 70,000[13] all TB cases yearly, however, NTP notified 48,800 (14) TB case during 2018 that shows Afghanistan NTP missed 21,200 cases during mentioned year that means 30% TB cases missed every years. Thus we conducted a cross sectional study to estimate the point prevalence by active case finding through house hold survey in selected district of Kabul city, Afghanistan.

METHODOLOGY

This was a descriptive cross sectional study conducted in Kabul city of Afghanistan. Kabul province is the capital of Afghanistan with more than four million population suffering from pollution; overcrowding; poor sanitation; with poor TB indicators e.g., low case notification, high transfer rate, low treatment success rate, no proper system for presumptive case management, poor health

infrastructure etc. Thus Kabul city was selected to carry out the study.

The study populations were > 15 years of age and all residents located in 21 sub-districts in Kabul City. Pregnant women as well as all non-consented were excluded from the study. The population was selected as per cluster sampling method. After taking informed consent, data collections were done using a semi structured questionnaire. The presumptive TB (PTB) were defined as anybody with signs and symptoms for TB i.e. cough for more than two weeks, night sweat, cough and Sputum with blood, unintentional weight loss. Data was collected about the demographic and socioeconomic, previous and current treatment for TB, contact with TB patients, BCG vaccination status. After primary screening all eligible presumptive TB patients went through laboratory tests. For that three sputum samples (on the spot, early morning and on the spot) were collected and Chest X- Ray (CXR) was done. For diagnosis and treatment of TB, the existing National Tuberculosis Control Program of Afghanistan algorithm was used [15].

Suggested diagnostic criteria were:

If symptoms positive, CXR negative, AFB negative do Gene X-pert

If symptoms negative, CXR positive, AFB negative do Gene X-pert

If symptoms positive, CXR positive, AFB negative do Gene X-pert

If symptoms positive, do Gene X-pert to identify RR/MDR-TB status

Operational definitions were clearly defined in the data collection tool. The strategy of screening for active TB and testing them for confirmation has been validated and recommended by the World Health Organization [16].

Socio-demographic and other relevant characteristics of the study participants using mean, standard deviation, median and percentages as appropriate. Data was statistically analysed with the significance level setting as two-tailed and at p value <0.05. Descriptive statistics for continuous variables were described as means ± standard deviation, while categorical data were reported as frequency and percentage. Differences between the two groups (males and females) were compared using Fisher's exact test for categorical variables, or independent t-test for continuous variables

Ethical approval

Ethical approval was taken from Institutional Review board of Islamic Republic of Afghanistan, Ministry of Public Health. All diagnosed TB patients were put into treatment with the government facility.

RESULTS

During the study period, the study team approached 3,228 households with approximately 22,596 individuals in 21 districts of Kabul city of Afghanistan. Among them, 6,740 (29.82%) individuals were eligible to be verbally screened for signs and symptoms of TB. The study team discovered 1,614(23.9%) individuals as presumptive to TB patients. The gender differences of the presumptive TB cases are plotted in figure 1. The age (mean + standard deviation) of the presumptive TB cases were 31.75 + 16.38 year. The study team also registered all household members of presumptive TB patients as contact and they registered 4,875 individuals of the presumptive TB patients to keep them for further follow up.

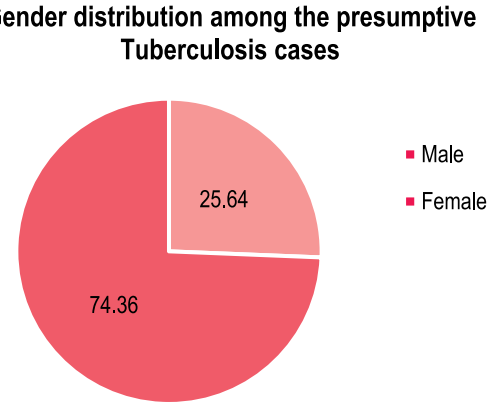

Figure 1: The gender distribution of the presumptive TB cases, Kabul, Afghanistan, 2018

While analysing the socio-demographic data, we found the mean family size was 8.4+ 4.4 persons. The mean daily incomes of the households were Afghan Currency (AFN) 288.8/ day. Among the presumptive cases, 139 (8.6%) households reported to have at least one chronic smoker in their household members. Also, 42 (2.6%) of

confirmed Pulmonary TB cases were smokers and average eleven cigarettes were consumed by them per day. The mean duration of cigarette smoking habit was 13.4 years. As the study was in Kabul districts, we found 1164 (72%) of the presumptive TB cases used natural gas and 435 (27%) used wood for regular household cooking.

We analysed the level of education of presumptive TB patients and found that 223 (13.8%) could read and write, 121 (7.4%) had primary education, 82 (5%) had middle education, 98 (7%) were high school graduates and 28 (1.7%) were university graduates. The occupations were diverse and the data is plotted in figure 2.

Occupation of the presumptive Tuberculosis patients

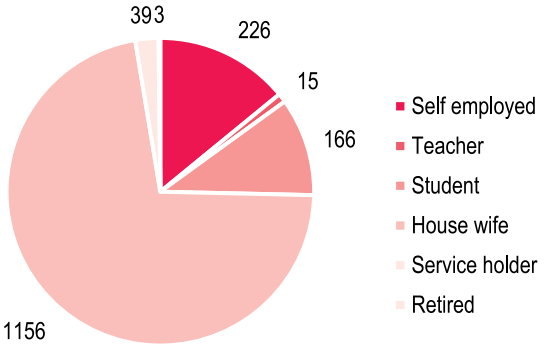

Figure 2: Occupational distribution of the presumptive TB cases, Kabul, Afghanistan

While analyzing the symptoms, we found, 1145 (71%) of presumptive TB cases had cough, 696 (61%) had productive cough means both sputum and cough and the mean duration for having cough was 2.3 weeks. Contact history showed, 116 (7%) had history of TB with in their family members (exposure to TB patients) and 73 (4.5%) had reported to have TB before the survey time. It includes both those already completed their TB treatment and those still under treatment at the time of study. All 1614 presumptive TB cases were screened by digital X-ray. Among them 1171 (72.55%) showed negative study for having TB by the radiologists. Three sputum samples were collected from rest 443 Presumptive TB cases and 50 (11.28%) cases were confirmed by Gene-Xpert and 55 (12.41%) cases had definite lesions suggestive of TB suggested by radiologists. Thus a total of 105 cases were laboratory positive to have TB which comprises 6.5% of all presumptive TB cases and 23.70% of 2nd screening by chest X-ray. Thus the case notification rate was 465 in 100,000 populations.

DISCUSSION

The study found that the presumptive TB case identification was higher in Kabul population compared to this rate among general outpatient department (OPD) attendance in public health facilities. The study shows higher rate of 23.9%, however, this rate has been less than 3% out of OPD attendances over the past decade in Afghanistan [17]. Therefore, it suggests higher prevalence of TB in Kabul city's population compared to the rests of the country and to that of WHO estimates for Afghanistan.

In addition, the findings are similar to the NTP and national health management information system (HMIS guideline, 2010), of Afghanistan. There was higher rate of female attendances in the study which is same as the HMIS data and there is higher rate of female attendees to public OPD clinics. Also, the findings from NTP shows that there is higher rate of female attendees and presumptive TB patients identification in public facilities and that is almost 60% and this study finds this rate higher than it and it is 74%. This could be because the male members of the household attends jobs and other activities outside the home and female usually stays at home during the day and it is illustrated as majority of the study population had housewife job. Thus, it can be concluded that male members of the family are usually missed from screen and NTP needs to address their need through strategy to address it at their work environment.

The family size of the study population is higher than findings of Afghanistan health survey (AHS) 2018. The household composition of the study population was 8.4%, although, this rate is 7.2% according to AHS 2018.

In contrast to NTP surveillance data which shows the positivity rate of almost 7% out of all presumptive TB patients, but this study found that this rate is 11.28% among study population.

Interestingly, the findings shows the higher prevalence of TB disease among Kabul city's population compared to the WHO estimated rate in its global TB report 2019. The prevalence of TB in Kabul city found to be 465 in 100,000 populations which are higher than WHO estimates of 340 in 100,000 populations.

CONCULSION

The findings of this study shows higher rate of respiratory symptomatic patients in Kabul city. The presumptive TB patient's identification rate was higher than the NTP data for over the past one decade. In addition, the positivity rate of new bacteriologically confirmed TB in study population is higher than the NTP data for the health facilities. That is 11.28% versus 7%, respectively. More interestingly, the prevalence of pulmonary TB is higher than the WHO estimated incidence and prevalence for Afghanistan. The yield of TB is 1.34% that is higher than WHO estimated prevalence of TB for Afghanistan. This is 2.4% higher than WHO estimated incidence of TB all forms among Afghan populations. Considering the findings of this study, we can conclude that TB is more prevalent in Kabul city compared to the rests of the country and the WHO estimates. In addition, this approach found to be an effective mechanism to find missing TB cases in a densely populated city of Kabul. In order to have the exact and more accurate population estimate, we the study team recommend the conduction of prevalence survey in Afghanistan. Moreover, we recommend the NTP to sustaining this active surveillance approach to find missed TB cases in cities like Kabul.

The study found that there is higher rate of female participation and that male members of the family may have missed from screening as usually male members attend jobs during the day and therefore, NTP need to shape strategy to address the need of screening of male individuals, mostly at their workplaces.

Improved and faster case detection was noted by using Xpert MTB/RIF assay than the culture and histopathology tests. We hence recommend the use of the same as the first-line investigation at laboratories for all suspected Spine TB cases and to gradually scale-down the processing by AFB staining and conventional culture. The results of the study may be used to improve existing Spinal TB diagnostics at medium sized hospitals by assessing the usefulness of the tests in their own set-ups and pick on the most optimal and accurate one. Age-old HPE may no longer be viewed as a reference standard and needs further evaluation.

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CONFLICT OF INTEREST

None

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