Tuberculosis control in Sri Lanka; Challenges and measures to overcome

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Abstract

Introduction and aims
Tuberculosis (TB) is regarded as the global leading cause of death among the infectious diseases. Sri Lanka is a country with low burden for Tuberculosis. Annually there is a case gap of 4,000 is found between WHO estimation and the actual detection in Sri Lanka. This research was done to explore the challenges on TB control in Sri Lanka and discuss the measures to overcome these barriers.

Methods
PubMed and Embase databases, National Programme for Tuberculosis Control and Chest Disease(NPTCCD) and Ministry of Health Sri Lanka websites were searched using subject headings and keywords. Unpublished data from NPTCCD were obtained with permission. Articles and content of grey-literature were screened for the relevance and quality.

Results
Following challenges were identified; Reduction of case findings, Inadequacy of human resources, Underutilization of the existing diagnostic facilities, Reduction of OPD referral, Obstacles for case finding with Covid 19, Reduction of contact tracing, Stigma, Reduction of social support.

Conclusion
There are many gaps and challenges in Tuberculosis control. They can be overcome by maximum utilization of available diagnostic facilities, increasing awareness among health care workers on available facilities and increasing OPD referrals to chest clinics.

Index Terms: Tuberculosis, Control, Challenges, Sri Lanka

I. INTRODUCTION

Tuberculosis (TB) is regarded as the global leading cause of death among the infectious diseases(1). It is caused by the organism *Mycobacterium tuberculosis*. In 2018, estimated 10.0 million (range 9.0-11.1 million) were diagnosed with TB(2). Sri Lanka is a country with low burden for Tuberculosis. Actual incidence of Tuberculosis in Sri Lanka is 37.8 cases per 100,000 population which is second lowest in the region next to Maldives. Nearly 8000-9000 patients of TB are detected each year(3). According to the WHO, estimated incidence of Tuberculosis in Sri Lanka is 14,000 (64 per 100,000 population) (4). This create a case gap of 4,000 between estimated and the actual detection(3). Case fatality ratio of Tuberculosis in Sri Lanka in 2018 was 6%(4). The incidence of TB in Sri Lanka remains static over the past four years.

National Programme for Tuberculosis and Chest Disease (NPTCCD) is the national level organization responsible for TB and Respiratory disease control activities in the entire country. Development of policies/guidelines in line with global standards and provision of technical guidance for the district are some of the activities of NPTCCD(5).

There are 26 district chest clinics (DCC), 108 branch clinics, 180 microscopy centres available to diagnose Tuberculosis in Sri Lanka (6). District Tuberculosis Control Officer (DTCO) is responsible for coordinating all the TB control activities at the district level and administrative head of the DCC. Consultant Respiratory Physician is involved with the diagnosis and management of Tuberculosis. Consultant Respiratory Physician is covering up duties in all most all the districts except Mullaitivu.

Consultant Microbiologist is responsible to conducting Culture and Gene X pert investigations. Sputum microscopy is conducted by the Public Health Laboratory Technicians(PHLT) or TB Assistants attached to the district chest clinics. X pert MTB facility was introduced to Sri Lanka in 2018 and there are 31 Gene X pert machines available in Sri Lanka. This facility helps in rapid diagnosis of TB and it does not require an expert training. This facility is available at microbiology labs in Sri Lanka under the guidance of Consultant Microbiologists.

This research was done to explore the gaps and challenges on TB control in Sri Lanka and to identify the way forward to overcome barriers in relation to the Sri Lankan healthcare system.

II.   METHODS

A comprehensive literature search was done in PubMed and Embase databases, NPTCCD and Ministry of Health Sri Lanka websites. The related subject headings (MeSH in PubMed) as well as related keywords were used in the search strategy. Unpublished data from NPTCCD were obtained with permission. The articles and content were screened by the investigator for the eligibility (relevance and quality).

III.   RESULTS

Following are the identified challenges for tuberculosis control activities.

1.**Reduction of case detection**
There is a reduction of TB incidence from year 2018 to 2019.In addition to the case gap of 4000 cases per year, there is a reduction of case finding. (Table1)

The estimated pediatric Tuberculosis TB cases should be 5 % from the total Tuberculosis case detection. Currently it is 2.8% from the total Tuberculosis cases. In 2019, estimated pediatric Tuberculosis TB cases was 391(which is 5% from the total TB cases) and the actual number is 234. There is a decline in Pediatric Tuberculosis case detection from 2018 to 2019. (Table2)

Table 1: Distribution of Tuberculosis case detection over 2006-2019

Source: National Programme for Tuberculosis Control & Chest Diseases

Table 2. Differences in Actual and Estimated Pediatric New Tuberculosis cases from 2010 to 2019 period
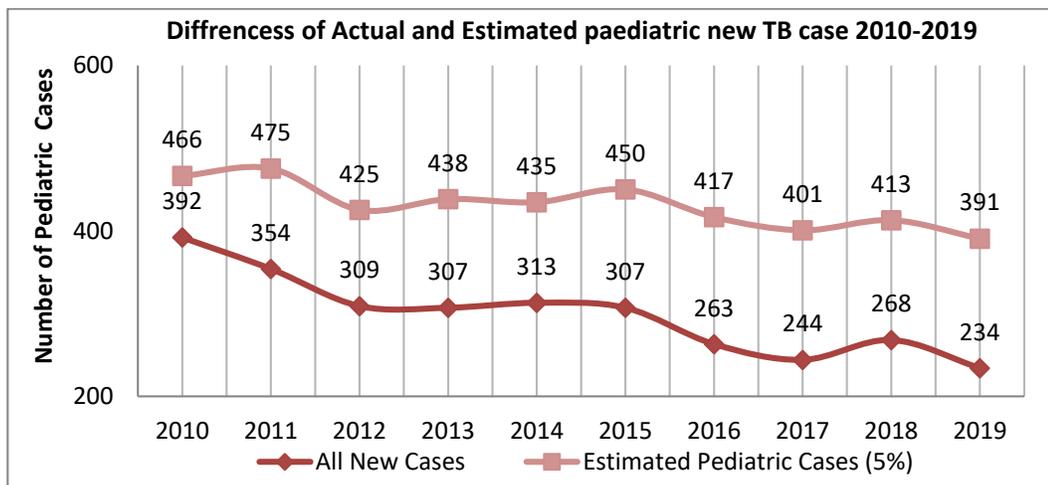
Source: National Programme for Tuberculosis Control & Chest Diseases

2. Inadequacy of human resources

This is another challenge when planning and monitoring activities in the national level, implementation of the policies, providing technical support to the district level, supervision of the DCC staff, supervision of the laboratory activities at the national level. Further at national level there is a lack of Consultant Community Physicians and Consultant Microbiologists and at district level, there is a lack of Medical Officers in the DCC, Public Health Inspectors(PHI), and PHLTs etc.

3. Underutilization of the existing diagnostic facilities

Though the Gene Xpert facility is available in Sri Lanka since 2018, still some of the General Physicians, Pediatricians and OPD Medical Officers are unaware the available locations of this facility, which leads to underutilization of this service. There were 17 digital X Ray machines available to take Chest X Rays from Tuberculosis patients. Advantage of digital X Ray over films are quality of the image, cost saving, easy to use and decreased radiation exposure(7). Underutilization of Digital X-Ray machines occur in some areas due to absence of a permanent radiographer to the chest clinics. In some chest clinics, X Rays are being taken once a week due to absence of radiographer and it leads to underutilization of this facility. In some centers though the digital X Ray machine is provided under global fund, there is delaying in developing the X Ray room and other infrastructure facilities utilizing provincial funds.

4. Reduction of OPD referral

In a Hospital OPD on average 2% of the OPD patients present with respiratory symptoms(8). If the symptoms are suggestive of TB, OPD doctor has to refer them to hospital microscopy center or nearest chest clinic with a sputum sample. Details of those patients have to be documented in the presumptive TB register which should be maintained at the hospital OPD. It was noticed that presumptive TB register is not updated compatible to the hospital OPD attendance. This leads to inability to trace the patients who have been referred from OPD but not reached to chest clinic. Further it will be not possible to get number of chest clinic referrals done from OPD unless it was updated properly. In addition, OPD Medical Officers are not allowed to order Chest X-Rays at the OPD. Therefore patients have to be admitted to get Chest X-Rays or it has to be taken from the private sector.

5. Obstacles for case finding with Covid 19

Covid 19 pandemic has affected the case detection of Tuberculosis. The island wide lockdown imposed in Sri Lanka from 20th of March 2020 it was lifted on 11th of May(9). During this 52 days there was a clear reduction of identification of Tuberculosis cases.

Table 3: Distribution of Tuberculosis case detection in January to August 2020
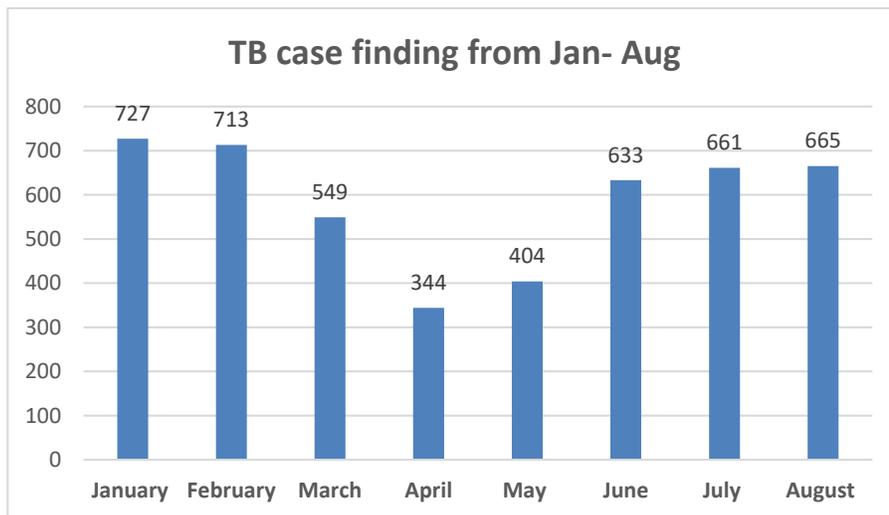
Source: National Programme for Tuberculosis Control & Chest Diseases

6.Reduction of contact tracing

In order to prevention and early Identification TB cases, all TB contacts should be identified and screening should be carried out. Highest percentage (43%) of TB cases was found in the Western Province of Sri Lanka in 2019 of which Colombo district had the highest number of 2024 cases and it is 23.9% of all cases. Large number of people are internally migrated to the Western province due to employment and education

purposes. There is lot of urban slums in in the city and poor socioeconomic living conditions in Western province facilitate the increase TB cases. Total number of contacts in Colombo district in 2019 was 5921 and of them 3051 were screened. Therefore, contacts screened percentage was 51.53% in Colombo district. Gampaha district had 1070 cases in 2019 and there were 2975 of total contacts. Out of that 1634 of contacts were examined and contacts screened percentage was 54.9%. In Sri Lanka highest number of cases are found in these two districts and contact screening should be improved to when reaching the targets.

7.Stigma
Since TB is a disease with stigma, case identification is a challenge to health care workers in all the districts. People usually are scared to know that they are having TB. Sometimes TB patients experienced family disruption, breaking marriages, losing jobs following diagnosis. Therefore, people tend to hide the disease condition and not reveal true facts of having TB. This affects largely to contact tracing.

8.Reduction of Social support
Once diagnosed, TB patients get a monthly allowance until completion of 6 months treatments. This allowance vary from province to province, from Rs.450 to Rs.5000 rupees per month. Providing adequate monthly allowance for TB patients is necessary to get a good outcome. Reduction of social support is another challenge when controlling TB.

9. Implementation of ePMIS system
National Programme for Tuberculosis Control and Chest Disease (NPTCCD) has implemented electronic Patient Management Information System (ePIMS) since 2019 by digitalizing the existing database greatly improving and streamlining data flow from districts to central level. The ePIMS consist of patient based module with all the information relevant to the patients management, lab module to enter laboratory data (microscopy, Gene Xpert and biochemistry results), MOH module to send and receive notifications and drug module to enter data on anti TB drugs. Although ePIMS is nationwide, there is a slow progress in adapting to the electronic information system by the health care workers at the District Chest Clinics when entering data. Patient registration Module is done in all districts and is of satisfactory level. However, entering follow up data, sputum conversion and outcome data are not at a satisfactory level.

IV. DISCUSSION

Filling the cadre as well as arrange regular training to staff is equal importance when reaching targets. PHLTs should be offered a regular training to avoid inaccurate findings at sputum microscopy tests. Quality assurance of the sputum samples should be carried out regularly to check the quality.

In some hospitals distance between microscopy unit and OPD is too far. Therefore, patients might loss way between OPD and microscopy center. If the hospital OPD is not maintaining or not updating Presumptive TB register properly it leads to losings patients contact information of those having respiratory symptoms. There might be undiagnosed TB patients among them which could spread the disease in the community. To overcome this there should be adequate referrals from OPD to microscopy center and they should maintain Presumptive TB register properly. Awareness among general practitioners, physicians, and pediatricians should be improved to sending adequate referrals to these centers.

Due to similar symptoms between Tuberculosis and Covid 19, it can affect the case findings of TB. The fear of public to present to the health care setting with cough, due to fear of stigma due to Covid, fear to be stay at a quarantine center for 2 weeks, separation from family members during that period were some

reasons leading to resistance of the public to reveal their symptoms unless they develop breathlessness. There was very minimal personal protective equipment for the health care workers at the initial stage of Covid. Due to that health workers were reluctant to collect sputum samples from patients and examine for TB. The difficulties in finding transport facilities and financial problems occurred during that period has an effect on reduction of case identification. However, once the lockdown period was over sample collection and case identification became gradually increased. With the persistence of Covid, until developing a effective vaccine, this challenge will not be overcome.

Lack of continuous training and commitment among health care workers, networking and hardware maintenance issues are main reasons for not fully utilizing the ePIMS system.   Once it properly implemented, real time data can be visualized without any delay and could be able to plan, monitor and disseminate the data efficiently.

V.   CONCLUSION

There is a nearly 4000 case gap found between estimated and actual case identification. Difficulty to identify the pediatric cases, underutilizing of existing diagnostic facilities, poor contact tracing, stigma, lack of social support, lack of human resources are identified as challenges. Maximum utilization of available diagnostic facilities, increase awareness among health care workers on available facilities, increase OPD referrals to chest clinics and hospital microscopy centers are recommended to overcome these challenges.

ACKNOWLEDGMENT

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