Introduction

This article briefly presents the available scientific data on ‘infectious nature of Tuberculosis (TB)’ to provide true picture addressing the concerns regarding safety of the close contacts of ‘infectious’ TB Patients. This article is written with an objective to build confidence of both physicians as health care providers and patients as end users of the service.

Physicians Concern

The first thought that occurs to any physician is the infectious nature of smear positive pulmonary TB patient and the importance of completing treatment under direct observation. The Directly Observed Treatment Short course (DOTS) strategy, which is implemented under Revised National Tuberculosis Control Programme (RNTCP) in India, has given desired confidence to the physicians in diagnosing and treating tuberculosis patients until cure. It is known that the regimens under DOTS strategy render most patients smear negative at the end of intensive phase of treatment. When patients are advised on this aspect, they may misinterpret the information that they are infectious until they become smear negative and as such they may also develop a tendency to avoid mingling with their close contacts till they are declared as ‘smear converted’ or ‘cured’.

On the other hand, the RNTCP ensures physicians to spend more time with patients and their family members in order to satisfy their doubts regarding infectious nature of the disease, treatment, ways and means of protecting themselves and others. Therefore it is more important for the physicians to allay the myths about infectious nature of TB to the patients before & during the period of treatment.

Patients worry/ Conception on TB Disease

Many patients have the following wrong beliefs and seek opinion on some of the concerns mentioned below:

- Preventive methods to be adapted in their daily routine to see how best a TB patient could be assisted to overcome the disease.
- Family members may enquire whether they can (i) permit children to come near TB patients, (ii) marital relationships could be continued, (iii) the patients should continue or stay away from work etc.
- Precautions to be observed to protect themselves and their siblings from contacting tuberculosis.
- Hygienic practices to be followed viz., covering the mouth while coughing or sneezing in order to prevent the airborne transmission of TB to their close contacts.
- Required time for restraining themselves from mixing with others.

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Scientifically Proven Facts on Infectious Nature of the Disease

The landmark study conducted by the Tuberculosis Chemotherapy Centre, Chennai (now known as Tuberculosis Research Centre) on the effect of treatment provided by “isolating” patients at Sanatorium or treatment given at patient’s “Home” for a period of one year and the number of close contacts belonging to either group getting infected and diseased before and after treatment. Isoniazid and PAS were administered orally for one year. Duration of contact with infectious patient was three months or more prior to diagnosis and all contacts were living in the same house. Incidence of TB infection (skin test positivity) among the close contacts of sputum smear positive pulmonary tuberculosis patients (called as index cases) was not different after starting treatment whether the index cases were isolated and treated at Sanatorium or treated at home. New infections seen among close contacts after start of treatment represented infections that had occurred prior to start of treatment. This study showed beyond any reasonable doubt that smear positive pulmonary TB patients were infectious before they were diagnosed and they had infected their close contacts even before they were started on treatment.

It is also necessary to understand that in the non-rifampicin containing treatment regimen, the smear status of more than 90% of patients became negative usually after six months of treatment. Still the risk of becoming infected after start of treatment was same whether they were isolated or not. Though the population density, family size, differences in climatic conditions, age, sources of infection and gender were likely to influence the proportion of close contacts getting infection and disease, evidence from many other studies confirmed the results that risk of becoming infected after start of treatment was same whether they were isolated or not. How fast they become non-infectious after start of treatment is not clearly known. This should not be a matter of concern because of the available scientific evidence as mentioned above. The reasons for reduced infectivity of smear positive cases on treatment is that they excrete droplet of sputum containing Tubercle bacilli coated with layers of anti-TB drugs. The rapid evaporation of these droplets in the atmosphere render the tubercle bacilli non-viable or less fit to infect others.

However, if transmission of TB infection is to be minimized, delays in diagnosis of an infectious patient becomes an important issue. If diagnostic algorithm as recommended under RNTCP is followed by all doctors, majority of infectious patients can be diagnosed as early as three weeks and the chance of spreading infection during this period is likely to be minimal. There is no basis to advise smear positive patients to be segregated from contacts for any fixed duration.

It is also important to realize that drug resistant patients are likely to infect to the same extent as those of drug sensitive cases before starting of treatment. This risk is much less in RNTCP due to its high cure rate achieved as a result of various inputs such as Directly Observed Treatment (DOT) by community DOT providers. These people are accessible and acceptable to the TB patients in terms of time and distance, and accountable to health system, towards providing potent short term chemotherapy drugs and ensuring quality diagnosis etc. Hence not many drug resistant cases are generated which in turn reduces risk of infection to close contacts.

The above mentioned facts may be explained in simple terms to the patients repeatedly to ensure their adherence to treatment.

Advice for Physicians

The smear positivity after start of treatment should not be mistaken for term infectivity. The above mentioned studies have shown clearly that ‘infectivity’ is not synonymous with smear and / or culture positivity during treatment. The in-vitro culture medium and washing procedure dilutes the action of drugs on the bacilli present in the specimens from patients under treatment and
hence allows for recovery of the bacilli. Whereas, continued action of drugs in-vivo is likely to render the organisms incapable of surviving in close contacts and are aided by immune defense mechanisms in protecting them from fresh infection. It is known that the mutations which render organism drug resistance also reduce its fitness to a varying degree.

Hence, continued smear positivity after start of treatment during intensive phase should not be the reason for advising any type of segregation. In regimens containing Rifampicin, because of rapid killing of the organisms, the smear tends to be positive even after culture has become negative and this fact is another reason for it being less infectious inspite of smear being positive.

It is necessary to realize that any advice given on segregation may result in loss of moral support for the patients by their close contacts. Some of these patients may resort to ‘refusal in taking their drugs’ in order to regain the attention of their close family members. This ‘default’ may prove to be detrimental to these patients.

In conclusion, it may be stated that it is not necessary to advice any sort of segregation for smear positive patients once they are on treatment. This information may also help the health care workers and DOT providers responsible for administering drugs to patients under RNTCP to do so without any fear of infection with TB bacilli.

**Points to be re-emphasized while providing health education to the Patients**

- Any patient with three weeks of cough or more may insist that his doctor should refer him to his nearest RNTCP health center or he may contact nearest health centre designated as ‘RNTCP Microscopy Centre’ for proper diagnosis and treatment of TB.

- Any person who has TB bacilli in his sputum will be infectious before start of RNTCP treatment.

- During the entire period of treatment, which is usually for a period of six months, a TB patient needs to undergo regular sputum examinations as advised by the Physician/health care worker.

- If he discontinues the treatment or is irregular in treatment, he may become infectious again to his family and his disease may become incurable.

- An infectious TB patient after getting cured gets cough, which may be a rare occurrence, he should have his three sputum specimen examined once again for TB germs. If no germs are found in all three specimens, he may undergo investigation and treatment for diseases other than TB.

**References**


