## ORIGINAL ARTICLE

# Household symptomatic contact screening of sputum smear positive tuberculosis patients at the DOTS clinic of SGT hospital, Gurugram

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### Article Cycle

### Abstract

**Background**:  Contact screening was conducted under ICMR (REFERENCE ID: 2019-07811) programme in villages near SGT hospital, Gurugram.  **Objective**:  To evaluate risk factors, extent of spread of tuberculosis among household contacts of tuberculosis cases and to create awareness. **Methods and Material**: Address of TB cases were taken from RNTCP register at DOTS clinic, SGT medical college. Then all household contacts of positive cases were screened, counselled and advised to approach ASHA Workers if such symptoms appear. Data was analysed using appropriate statistical methods. **Results**:21 Index cases along with 94 household contacts were screened. 61.90% families still use chullahs for cooking**.** 76.1% families have overcrowding. 3) 61.90% families had inadequate ventilation 4) 19.05%families were aware about the spread of this disease. 5)Only 23.80% families practised adequate sanitation methods and precautions6) 42.8% Index cases had a history of smoking. 7) 44.4% 4 continue to smoke with infection. The association of adequate sanitation with presence of awareness was found to be statistically significant. (p-value<0.05). Other factors were not significantly associated with level of awareness regarding prevention of tuberculosis spread among study participants. **Conclusions**: Contact screening is an effective tool and it gives the real-time picture of TB in India.

### Keywords

### Introduction

Active screening could lead to the detection of additional cases. (1). Patients become more contagious as they delay treatment of tuberculosis.(2) Contact screening follows risk stratification concerning the infectiousness of the index patient,  duration and proximity of exposure, and the susceptibility of the contact (3, 4). Risk of active TB among household contacts of active case subjects is very high (5) Screening has been recommended by the World Health Organization. (6) Symptomatic contacts shall be subjected to tests as per RNTCP guidelines (7) It ensures reducing the disease burden, the risk of transmission and poor treatment outcomes (8).The risk relates to the infectiousness of the patient, duration of exposure and proximity (10, 11) and susceptibility of the contact (12, 13).It detects 2.3% patients with pulmonary TB amongst close contacts (9, 14). In China, the yield for a  TB case finding through contact investigation ranged from 0 to 6.9%   (15, 16).Studies from districts of south India concluded that there is suboptimal implementation of contact screening  (17, 18).A source case investigation with TB  showed that opportunities for TB prevention were being missed because contact tracing is poorly

implemented in India.(19) A study reported detection of 6% secondary cases among the household contacts of index TB cases (20).

## Aims & Objectives

1. To evaluate risk factors in household contacts acquiring tuberculosis disease.
2. To assess extent of spread of tuberculosis among household contacts of sputum smear positive tuberculosis index cases.
3. To create awareness about tuberculosis to both patients and household contacts.

## Material & Methods

The study was conducted after obtaining ethical clearance from the Institutional Ethical Committee of SGT Medical College, Gurugram. The study was of 2 months for data collection, analysis and report making.

Address of all index cases (sputum smear positive TB cases) had been taken from RNTCP register at DOTS clinic, SGT medical college, Gurugram. In order to locate the houses of the area under the DOTS clinic of SGT hospital, the help of ASHA workers was taken. Regular meetings were held with the ASHA workers, and they were counselled and oriented about the disease and how to help the families. Then all household contacts of these sputum smear positive cases had been screened for the symptoms like current cough, fever, weight loss and night sweats. Household contacts were counselled about symptoms of TB and advised to approach ASHA Workers if such symptoms appear.

Symptomatic contacts shall then be subjected to the following tests as per RNTCP guidelines (7)

a) Sputum smear test was done at the Designated microscopic centre (DMC) under RNTCP at SGT hospital, Gurugram,
b) X-ray chest Postero-Anterior view at SGT hospital, Gurugram.
c) CBNAAT (Cartridge Based Nucleic Acid Amplification Test) at district tuberculosis centre (DTC), Gurugram.

Once found positive, these patients were provided treatment and Isoniazid chemoprophylaxis (for children < 6 years of age who are not diagnosed with TB) as per RNTCP guidelines at DOTS Clinic, SGT Hospital, Gurugram. Presence of risk factors like HIV/AIDS, Diabetes, Malnutrition, history of immunosuppressive drugs etc among household contacts shall also be recorded using a pretested questionnaire.

Tests for HIV/STDs shall be done at ICTC centre, SGT hospital, Gurugram and test for diabetes shall be done at SGT hospital.

In the current study 21 index cases and 94 household contacts were screened in Rural villages near SGT hospital, Gurugram (Mankrola, Kaliyawas, Iqbalpur, Chandu, Budhera, Pataudi)

Data collected is analysed using appropriate statistical methods for analysis (Microsoft Excel), then is represented in the form of various pie charts, bar graphs and by defining various percentages.

**Statistical Analysis:** Data collected is analysed using appropriate statistical methods for analysis (Microsoft Excel), then is represented in the form of various pie charts, bar graphs and by defining various percentages.

## Results

Sample size included 21 index cases with 94 household contacts (approximately 4 per family)

- 8 contacts were below the age of 8 (8.51%)
- 38 contacts were between the age of 6 to 18 (40.4%)
- 48 contacts were above the age 18 (51.06%)

**Risk factors**

**Use of chullah** – Despite modern amenities, 13 out of 21 families still use chullahs for cooking. This increases indoor air pollution affecting the health of householders. (61.90%)

**Overcrowding**-While the recommended habitable space is 50 sqft per person (according to the floor space criterion), I noted 4 or more people living in a single room (persons per room criterion). 16 out of 21 families have overcrowding. (76.1%)

**Ventilation** – Due to the economic condition of rural families, windows of adequate size were not installed. Houses were built close to each other and windows where present were next to the wall of another house. 13 out of 21 families had inadequate ventilation. (61.90%)

**Awareness** – Due to lack of education and awareness of the nature of the disease and consequent precautions to be taken, only 4 out of 21 families were aware about the spread of this disease or about the precautions to be taken (19.05%)

**Sanitation** - Only 5 out of 21 families practised adequate sanitation methods (washing of hands before eating, disposal of household waste) and precautions (disposal of sputum, wearing masks) (23.80%)

**Smoking**-9 out of 21 Index cases had a history of smoking. (42.8%). All forms of smoking were considered.

**Current smoking status** - 4 out of the above mentioned 9 cases still continue to smoke with infection which further debilitates the lungs. (44.4%)

## Discussion

In the current study 21 index cases and 94 household contacts were screened in Rural villages near SGT Gurugram (Mankrola, Kaliyawas, Iqbalpur, Chandu, Budhera, Pataudi)

In majority of the families, due to lack of awareness of the spread of disease and various other superstitions several risk factors were observed.

Due to the short time span of the research, no contacts out of the 94 had symptoms suggestive of TB. But, due to the above-mentioned risk factors, there is still a chance of them being infected which can only be detected in the future.

However, other studies which have been performed over longer time periods yield the following results.

Study showed that 3.45% (n = 18) of household contacts were symptomatic with symptoms suggestive of TB. One third of these symptomatic contacts were later diagnosed to have TB giving a prevalence of 1.15% among the household contacts of index cases. This amounts to an additional yield of 4.51% for the 133 index cases. This highlights that symptomatic household contact screening could be used as a prospective case detection tool. findings suggest that BMI, duration of symptoms and duration of contact with index cases could be important predictors for risk of TB among symptomatic contacts (1)

In another study conducted in Kenya, mothers attending maternal and child welfare clinics were interviewed for detecting TB suspects in their households. Mothers were asked to give letters to the suspects asking them to come to clinic for screening. This approach resulted in 4% of annual incidence of SS positive cases being detected with very few resources being expensed.(21)

A source case investigation for children with TB disease in Pune, India also showed that opportunities for TB prevention and control were being missed because contact tracing is poorly implemented in India.(19)

Blok et al.(22) published a meta-analysis from 19 projects across Asia, Africa, and Middle-East. They reported a pooled yield of 1.5% (range: 0.1–6.2%) among the contacts screened and 1.8% of total cases being reported by means of contact investigation. They also concluded that background prevalence of TB and setting of projects (rural/urban/mixed) results in variation of yield.

A total of 1386 newly diagnosed active TB cases were reported and their 5392 household contacts were screened. The overall prevalence of active pulmonary TB among household contacts was 3.76 % (23)

There is evidence that risk of active TB among household contacts of active case subjects is very high (5) which indicates that investigating the symptomatic household contacts could provide a powerful approach to explore undiagnosed cases in the community. The focus on symptomatic contacts offers a cost effective alternative and the findings of this study suggest the need for more research to assess the cost effectiveness and large-scale adoption of household contact tracing for detection of TB.

## Conclusion

Contact screening is an effective tool and it gives the real-time picture of TB in India

## Recommendation

The above mentioned risk factors must be curbed and home inspection of patients must be done.

## Limitation of the study

Due to the short time span of the research, no contacts out of the 94 had symptoms suggestive of TB. But, due to the above-mentioned risk factors, there is still a chance of them being infected.

## Relevance of the study

Contact screening is an effective tool and it gives the real-time picture of TB in India

## Authors Contribution

All authors have contributed equally.

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## Tables

### TABLE 1 CONTACTS UNDER DOTS CLINIC

| Age | Number of contacts | Percentage |
|---|---|---|
| below 5 | 8 | 8.51% |
| below 18 | 38 | 40.40% |
| above 18 | 48 | 51.06% |

### TABLE 2 USE OF CHULLAH IN HOUSEHOLDS

| Use of Chullah | | Percentage |
|---|---|---|
| Yes | 13 | 61.90% |
| No | 8 | 38.09% |

### TABLE 3 OVERCROWDING IN HOUSES

| Overcrowding | contacts | Percentage |
|---|---|---|
| Yes | 16 | 76.10% |
| No | 5 | 23.80% |

### TABLE 4 VENTILATION IN HOUSEHOLDS

| Adequate Ventilation | | Percentage |
|---|---|---|
| Yes | 8 | 38.09% |
| No | 13 | 61.90% |

### TABLE 5 AWARENESS IN HOUSEHOLDS

| Lack of awareness | number of contacts | Percentage |
|---|---|---|
| Yes | 17 | 80.95% |
| No | 4 | 19.05% |

### TABLE 6 SANITATION IN HOUSEHOLDS

| Adequate Sanitation | Number of contacts | Percentage |
|---|---|---|
| Yes | 5 | 23.80% |
| No | 16 | 76.10% |

### TABLE 7 SMOKING IN INDEX CASES

| Smoking | Number of contacts | Percentage |
|---|---|---|
| Yes | 9 | 42.80% |
| No | 12 | 57.10% |

### TABLE 8 SMOKING STATUS OF INDEX CASES

| Smoking status | Current status | Percentage |
|---|---|---|
| Yes | 4 | 44.40% |
| No | 5 | 55.50% |

### TABLE 9 EFFECT OF AWARENESS ON SOCIODEMOGRAPHIC & RISK FACTORS.

| | | Lack of awareness | | Total | p-value |
|---|---|---|---|---|---|
| | | No | Yes | | |
| Gender | F | 1 | 4 | 5 | 0.7 |
| | M | 3 | 13 | 16 | |
| Village | | 0 | 2 | 2 | |
| | Basai | 1 | 1 | 2 | |
| | Farukhnagar | 0 | 1 | 1 | |
| | Gurgana | 0 | 1 | 1 | |
| | Gurgaon | 0 | 1 | 1 | |
| | Iqbalpur | 0 | 4 | 4 | |
| | Manesar | 1 | 0 | 1 | 0.37 |
| | Mankrola | 1 | 3 | 4 | |
| | Palwal | 1 | 0 | 1 | |
| | Pataudi | 0 | 1 | 1 | |
| | Sadrana | 0 | 1 | 1 | |
| | Sonipat | 0 | 1 | 1 | |
| | Taj nagar | 0 | 1 | 1 | |
| Formal Education | Yes | 4 | 15 | 19 | 0.65 |
| | No | 0 | 2 | 2 | |
| Use of Chullah | No | 1 | 7 | 8 | 0.5 |
| | Yes | 3 | 10 | 13 | |
| Overcrowding | No | 1 | 4 | 5 | 0.7 |
| | Yes | 3 | 13 | 16 | |
| Adequate Ventilation | No | 1 | 12 | 13 | 0.13 |
| | Yes | 3 | 5 | 8 | |
| Adequate Sanitation | No | 1 | 15 | 16 | **0.02** |
| | Yes | 3 | 2 | 5 | |
| Smoking | No | 3 | 9 | 12 | 0.41 |
| | Yes | 1 | 8 | 9 | |
| Smoking status | No | 3 | 14 | 17 | 0.6 |
| | Yes | 1 | 3 | 4 | |

## Figures

### FIGURE 1 SHOWS THE AGE GROUP OF CONTACTS STUDIED



below 5, 8
below 18, 38
above 18, 48