

A Study on the Socio-Demographic and the Clinical profiles, along with some Management Indicators, of the MDR TB patients at the Domjur Block, Howrah District, West Bengal, India

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Abstract

Tuberculosis (TB), caused by *Mycobacterium tuberculosis*, is the main cause of death worldwide, due to a single infectious agent (Mello, Silva, & Dalcolmo, 2018). Multidrug-resistant TB (MDR TB) is resistant to both isoniazid and rifampicin (the two standard TB drugs), and may or may not be resistant to other drug/s; hence, it (i.e., MDR TB) is a great cause of worry, and a major challenge to any TB control programme.

The objective of this cross-sectional study is to analyze the socio-demographic and the clinical profiles, along with some management indicators, of 23 MDR TB patients at the Domjur Block, Howrah District, West Bengal, India, in 2018. Thus, it is a twofold project with two sub-objectives.

One of the sub-objectives is to study the influence of six important criteria (viz., age, sex, religion, educational status, occupational status, and family income) related to the socio-demographic profile of 23 MDR TB patients at the Domjur Block, on the occurrence of MDR TB in that block, in 2018, using the binomial test at 5% level of significance. The corresponding formula for calculating the p-value (p1) is:

$$p1 = 2n! / (n! X! p^X q^{n-X}) \quad (1)$$

where, n=total number of MDR TB cases=23; X=n/2=11.5≈12;

p=proportion of cases corresponding to the first variable pertaining to a criterion; q=proportion of cases corresponding to the second variable pertaining to the same criterion.

If $p1 < 0.05$, for a criterion, then it can be inferred that the relevant criterion had a significant influence on the occurrence of MDR TB at Domjur; otherwise the influence was not significant.

The other sub-objective is to record data about the clinical profile of those 23 MDR TB patients, and some key indicators corresponding to the management of those patients by the health centre at the Domjur Block. The indicators are expected to help in understanding how the RNTCP (Revised National Tuberculosis Control Programme) of the Government of India, was going on in that block, in 2018.

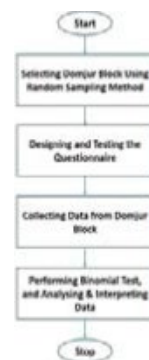
The Domjur Block was selected by the random sampling method among the blocks of the Howrah District. Before performing this study, a brief literature survey was done, but no work related to the MDR TB patients of Domjur, was found.

Methodology

a) **Study area:** A map of the study area i.e., the Domjur Block is shown in figure-1.



Figure-1: The Study Area



b) **Method:** The flowchart describing the method is depicted in figure-2

Results and Discussions

The collected data corresponding to the socio-demographic profile, and the results of the binomial test, are as follows:

Tables- 1a-1f depict the data regarding the six important criteria related to the socio demographic profile of the MDR TB patients.

| 0-39 Years | 40 Years & Above | Total |
|------------|------------------|-------|
| 17 | 6 | 23 |
| 74% | 26% | 100% |

[p-value: 0.0268<0.05; significant]

Table-1a: Age Distribution of the MDR TB Cases

| Male | Female | Total |
|------|--------|-------|
| 10 | 13 | 23 |
| 43% | 57% | 100% |

[p-value: 0.0268<0.05; significant]

Table-1c: Religions of the MDR TB Cases

| Hindu | Islam | Total |
|-------|-------|-------|
| 10 | 13 | 23 |
| 43% | 57% | 100% |

[p-value: 0.2230>0.05; not significant]

Table-1d: Educational Status of the MDR TB Cases

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| No Education/ Education up to School Level (Class- XII) | Education Higher Than School Level | Total |
|--|---------------------------------------|-------|
| 21 | 2 | 23 |
| 91% | 9% | 100% |

[p-value: $2.7366 \times 10^{-6} < 0.05$; significant]

Table-1e: Occupational Status of the MDR TB Cases

| Doing Job Involving Manual Labour | Not Doing Job/ Doing Job Not Involving Manual Labour | Total |
|---|---|-------|
| 10 | 13 | 23 |
| 43% | 57% | 100% |

[p-value: $0.2230 > 0.05$; not significant]

Table-1f: Family Incomes (in Rupees/Month) of the MDR TB Cases

| ≤ 10000 | > 10000 | Total |
|--------------|-----------|-------|
| 17 | 6 | 23 |
| 74% | 26% | 100% |

[p-value: $0.0268 < 0.05$; significant]

Figure-3 gives a qualitative idea about the influences of the six criteria on the occurrence of MDR TB at Domjur, according to the results of the binomial test.

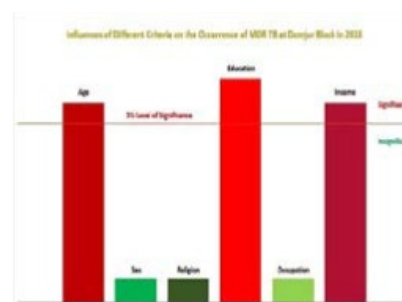


Figure-3: Graph Showing Qualitatively the Impacts of Different Criteria on the Occurrence of MDR TB at Domjur [Here, lower the p-value, higher is the corresponding bar. The expression used for drawing the graph is: $((100(1 - p1)) - 75)$, where $p1$ is given by equation (1).] Tables- 1a-1f and figure-3 depict that age, educational status and family income had significant influences on the occurrence of MDR TB at Domjur, the significance of the influence of educational status being the maximum. Tables- 1a-1f and figure-3 also show that sex, religion and occupational status did not have significant influence on the occurrence of MDR TB at Domjur.

Thus, the following two moves by the pertinent authority can help in lessening the occurrence of MDR TB:

- Making arrangements for public education, up to college (undergraduate) and, if possible, university (graduate and higher) levels.
- Taking steps for increasing the income of people to ensure good nutritional status.

The collected data pertaining to the clinical profile and some management indicators of the MDR TB patients, are as follows: Table-2 shows the signs & the symptoms of the MDR TB patients.

| Cough | Low Grade Fever | Weight Loss | Respiratory Distress | Chest Pain | Loss of Appetite | Weakness | Night Sweat | Haemoptysis |
|-------|--------------------|-------------|-------------------------|------------|---------------------|----------|-------------|-------------|
| 23 | 16 | 15 | 6 | 11 | 11 | 6 | 5 | 5 |
| 100% | 70% | 65% | 26% | 48% | 48% | 26% | 22% | 22% |

[HIV: Human Immunodeficiency Virus; CBNAAT: Cartridge Based Nucleic Acid Amplification Test; AFB: Acid Fast Bacillus.]

Table-2: Signs & Symptoms of the MDR TB Cases

| Sputum Culture Done | | Diagnosis Done & Treatment Started in Proper Time | | Medicine Supplied in Proper Time | | Regular Visit by Health Staff | | Regular ntake of Medicine by Patient | | Total |
|---------------------|-----|---|----|-------------------------------------|----|----------------------------------|-----|--|-----|-------|
| Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | |
| 19 | 4 | 22 | 1 | 23 | 0 | 19 | 4 | 16 | 7 | 23 |
| 83% | 17% | 96% | 4% | 100% | 0% | 83% | 17% | 70% | 30% | 100% |

Table 4: Factors Essential for Offering Quality Treatment to the MDR TB Patients

Tables- 3 & 4 depict the indicators corresponding to the management of the MDR TB patients by the health centre at the Domjur Block. The regularity of intake of medicine by the patient depends not only on the patient's own awareness and initiative, but also on the degree to which the patient has been motivated by the relevant health personnel; hence it is also a valid indicator pertaining to the management of the MDR TB patients.

The indicators in the tables- 3 & 4 reflect the following:

- The RNTCP was going on reasonably well at the Domjur Block, in 2018.
- However, a lot was yet to be achieved, particularly with regard to motivating the patient to regularly take medicine, performing AFB test, doing sputum culture, the practice of regularly visiting the patient by the health staff, performing CBNAAT, doing chest X-ray, and diagnosing the disease & starting the treatment in proper time; hence, there is no room for complacency.

Conclusion

This project has attempted to throw some light on the relationships between the occurrence of MDR TB and some criteria associated with the socio-demographic profile of MDR TB patients and also on the performance of the RNTCP, with only a small amount of data. A more comprehensive picture about the occurrence of MDR TB could have been obtained, if other criteria related to the sociodemographic profile of the MDR TB patients were also incorporated in the study. Besides, if a control group of non-MDR TB patients were included, the results would have been more accurate. Moreover, if other blocks were also considered, higher number of patients would have been available for study, and hence, the scope of the work would have increased. If possible, all these assignments can be taken up in future. If data on other indicators pertaining to the management of the MDR TB patients by the health centre, were available,

a more comprehensive idea about the performance of RNTCP could have been had. This task can also be accomplished in future, if possible.

References

1. Government of West Bengal. (2020). Official Website Of Howrah District,

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2. Retrieved from <http://www.howrah.gov.in/adminunits/Domjur.html>

3. Mello, F. C. de Q., Silva, D. R., & Dalcolmo, M. P. (2018). Tuberculosis: where are we? *Jornal Brasileiro de Pneumologia*, 44(2), 82.