

A STUDY ON AETIOLOGICAL FACTORS OF TUBERCULOSIS

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TUBERCULOSIS is a public health problem of major importance in the world. There are about 15-20 million infectious or active cases in the world. At present according to WHO, no country in the world has reached the point of control, i.e., "less than one per cent tuberculin positivity among children in the age group of 0-14 years". However, in the developed countries like U.S.A. the death rate has declined steadily between the years 1900-1972 from 194.1 to 2/100,000 people. The decreased mortality has been attributed to their high standard of living, good nutrition and maintenance of high standard of sanitation (3). In India, the situation is different. The survey conducted by the National Tuberculosis Institute, Bangalore, reveals that tuberculosis is still very much prevalent in our country. This may be attributed to quantitative as well as qualitative malnutrition existing in India. Under-nutrition would bring down individual's defence mechanisms and increase his susceptibility towards infections like tuberculosis. Infection in turn again contributes to malnutrition. For this reason mortality from tuberculosis has not decreased to an appreciable extent. According to the survey, in India nearly half the population becomes infected at one time or the other but 10 million people actually suffer from the disease. Therefore tuberculosis is a national health problem of major importance in India (3).

It is important and necessary that prophylactic measures should be updated and studies should be conducted periodically to identify and analyse new aetiological factors of the disease. Hence the present survey was conducted on tuberculosis patients to find out the aetiological factors responsible for the disease.

MATERIALS AND METHODS

The present study was undertaken in two Tuberculosis Sanatoria at Mysore and Bangalore. Two hundred and forty adult patients suffering from pulmonary Tuberculosis were interviewed individually in their wards with the help of an oral questionnaire. Information regarding following aspects was obtained.

1. Personal and family background information

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2. Habitat and living conditions
3. Personal habits and health status
4. Food practices and
5. Special aspects concerning women patients

RESULTS AND DISCUSSION

The results of the present study are presented as follows:

1. **Personal and family background:** Of the 240 patients interviewed, 178 were males and 62 were females. It is well established that TB is more prevalent among males than females, which may be due to the fact that men have greater chances of exposure to infection (3).

Sixty per cent of the total sample belonged to the age group of 20-40 years whereas 30 per cent were 40 years and above. Less than one per cent belonged to the age group of 12-19 years. Studies have revealed that TB is more common among individuals belonging to the age group of 20-50 years (3).

About 47 per cent of the patients were illiterates and a small percentage had been educated below the primary (11.6 per cent) or middle school (17.5 per cent). Only four patients were graduates.

Most of the patients were agricultural labourers or industrial workers and earned a monthly income of less than Rs. 200. Hence all of them belonged to the lower socio-economic group. Poverty is an important cause of the disease. Prevalence of TB tends to be higher in the low income groups than in the high income groups.

The family size was found to be fairly large. Forty-three per cent came from families with a total family members of 6-8 in the household. About 41 per cent of the married sample had four or more children. The larger families are likely to be poorer and undernourished. These factors are known to be associated with TB.

Majority of the patients were Hindus (80 per cent) whereas rest were Muslims (19.3 per cent) and Christians (0.8 per cent).

A familiar occurrence of TB was noted in about 41 per cent of the patient population.

2. Habitat and living conditions: 70 per cent of the patients came from urban areas and a smaller percentage from the rural areas. Sixty per cent lived in highly industrialised areas. Urbanisation and industrialisation are probably significant social cause of the disease. In addition 82 per cent lived in overcrowded and thickly populated areas and 87 per cent lived in small houses comprising single rooms. Small houses may not have adequate ventilation, lighting and floor space, which favour the spread of infection by droplet nuclei and infected dust (3).

3. Data regarding personal habits and health status: The study revealed that about 53 per cent of the patients were heavy smokers whereas 44 per cent were chronic alcoholics, 18 per cent had tobacco chewing habit.

It is a proven medical fact that smoking can cause TB. A comparative study of smokers and non-smokers revealed that in the case of former there is an increased risk of lung cancer and pulmonary TB. Smoking is found to result in frequent upper respiratory tract infection. Likewise alcohol causes multiple deficiencies and leads to malnutrition. Tobacco which is frequently kept in the dental cavity with lime, is pungent, hot in nature and toxic in its action. It can predispose towards Tuberculosis.

About 77 per cent suffered from frequent colds and coughs, which might have been responsible to certain extent for Tuberculosis.

It is significant that 126 patients suffered from worm infestation and diarrhoea. Since personal and environmental hygiene is an essential part of TB treatment programme, a survey was undertaken near Madras (7) to find whether there was any aetiological relationship between intestinal parasite infection and TB. The results indicated that there was no relationship between the two. However, worm infestation and recurrent diarrhoea can lead to malnutrition which in turn results in decreased body resistance to infections (7).

Majority of the patients (90 per cent) were not vaccinated during childhood against TB.

4. Food consumption pattern of the patient: The principal cereals and millets consumed by the patients were rice and ragi. Wheat, jowar, parboiled rice, sprouted pulses, green leafy vegetables were consumed occasionally. As can be expected the consumption of fruit, milk and milk products, flesh foods and eggs were very poor as they are very expensive. From these results it is obvious that the food consumption pattern in general is poor. This may be attributed to their low socio-economic status and ignorance. The nutritive value of the diets of the patient can be improved by including sprouted

pulses, green leafy vegetables, mixed cereals without additional cost.

Food serving practices: Almost all patients boiled milk before drinking (96.7 per cent) and consumed cooked meat (90.8 per cent). These observations rule out the possible role of transmission of bovine TB through the agency of milk and meat. It was found that about 92 per cent of the patients used spoons and ladders for transferring food stuffs which was contrary to what was expected. However nearly 92 per cent used common utensils for the purpose of eating and drinking. This observation is important as TB may be transmitted from one family member to the other through the use of common utensils. It is for this reason, we observe that nearly half of the sample had a familiar occurrence of TB (2).

5. Special aspects concerning women patients: It is indicated that 12 of the 62 female patients followed purdah system. A high prevalence of TB is reported among the Muslims where women remain in purdah for a long period of time, there are greater chances of exposure to infection when women stay indoors for a long period of time.

Seventy-one per cent of the women were married below the age of 20. Thirty-nine per cent underwent repeated pregnancies more than six times. Considering the fact that teenagers who enter marriage are exposed to stresses like pregnancy and lactation, this imposes an additional nutritional stress which leads to malnutrition.

Prolonged breast feeding could be observed among the mothers. Therefore early marriage, repeated pregnancies and prolonged breast feedings lower the body resistance and render the young women vulnerable to infectious diseases like TB (3).

6. Nutritional Status: It is evident that the patients were considerably underweight as revealed by comparison of their weight for height to the standard as given by Jelliffe (1966). Nutritional anthropometry reflects nutritional status of an individual.

SUMMARY AND CONCLUSION

The present study was conducted to get an insight into the current aetiological factors of pulmonary Tuberculosis. Two hundred and forty in-patients of two Sanatoria were interviewed with the help of an oral questionnaire and information regarding their family background, habitat, living conditions, personal habits, health and nutritional status, food habit were obtained.

The analysis of the data revealed that most of the patients were males and 20-40 years of

age, illiterates and came from urban, industrialized and thickly populated areas. They belonged to large families, residing in small houses and belonging to low socio-economic group. A substantial number of the patients were heavy smokers and chronic alcoholics. Three fourths of the patients were suffering from frequent colds and coughs. Fifty per cent of them suffered from chronic worm infestation and diarrhoea.

The staple cereals and millets consumed by the patients were ragi and milled rice. Parboiled rice, wheat, jowar were not consumed frequently. Sprouted pulses, green leafy vegetables, milk and milk products and flesh foods were occasionally consumed.

It was found that the patients used common utensils for the purpose of eating and drinking.

The nutritional status as assessed by anthropometric measurements was poor. The patients were far below the standard weight.

Most of the female patients were married below the age of 20 and had experienced repeated pregnancies and abortions. Prolonged breast feeding seemed to be in vogue.

Hence it can be concluded that malnutrition induced by social factors such as poverty, illiteracy, large families, industrialisation, smoking and alcoholism, unhygienic environment, poor food habits, conditioning factors such as diarrhoea, worm infestation and physiological stress conditions predispose an individual to infectious diseases like TB.

However, following preventive measures may be recommended to reduce the incidence of the disease.

1. **Nutrition Education:** Enlightening the public about simple dietary modifications which will

improve the nutritional quality of the diet without additional cost.

- Advocating the use of low cost pulses.
- Greater use of sprouted pulses and cereals.
- The frequent use of parboiled rice partially milled rice, wheat and jowar, in place of milled rice alone.
- Hygienic handling of food.

2. Improving the environmental sanitation.

3. Frequent deworming measures.

4. Controlling the growth of population and making the people accept small family norms.

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TABLE
PERSONAL HABITS AND CERTAIN HEALTH DISORDERS OF THE PATIENTS

Habits	Frequent colds and coughs	Worm infestation	Diarrhoea	Familial occurrence of TB
Yes	No	No. & %	No. & %	No. & %
Smoking	126 (52.5)	124 (47.5)	Yes 126 (52.5)	Yes 98 (40.8)
Alcoholism	82 (44.2)	158 (65.8)	No 112 (47.5)	No 142 (59.2)
Tobacco	144 (58.3)	106 (41.7)		