

**Author Affiliation:**

<sup>1</sup>Senior Resident, <sup>2</sup>Assistant  
<sup>3</sup>Professor, Professor and HOD,  
Department of Pediatrics,  
Department of PSM, Vithalrao  
Vikhe Patil Foundations Medical  
College and Hospital, Vilad Ghat,  
MIDC, Ahmednagar-414111, India.

**Coresponding Author:**

**Ujjwala Shirasath,**  
Assistant Professor, Department  
of Paediatrics, Vithalrao Vikhe  
Patil Foundations Medical College  
and Hospital, Vilad Ghat, MIDC,  
Ahmednagar-414111, India.  
**E-mail:** shubhadasunil@gmail.  
com

## To study the Clinical Profile of Tuberculosis in BCG Vaccinated Children.

Ganesh Misal<sup>1</sup>, Ujjwala Shirasath<sup>2</sup>, Shubhada Avchat<sup>3</sup>

**How to cite this article:**

Ganesh Misal, Ujjwala Shirasath, Shubhada Avchat, To study the clinical profile of Tuberculosis in BCG Vaccinated Children. Indian J Comm Dis. 2020;6(1):9-12

**Abstract**

**Introduction:** Tuberculosis (TB) remains a major public health problem, despite noteworthy socioeconomic development and advances in medical science. Globally it has been estimated that 1.9 billion people (1/3 of world's population) are infected and 5000 people die of Tb Globally each day. Out of which 95% are in the developing world. In India 1.8 million new cases annually accounting for one fifth of new cases. Two of every 5 persons (>400 million) in general population have latent tuberculosis. **Methods:** This prospective study was conducted at our tertiary care hospital over a period of 11 months. Children in the age group from 2 months to 12 years attending the Outpatient Department, admitted in the wards and PICU. **Results:** Study was done on 120 patients. Maximum number of cases were in the 1 to 5 years age group 35(41.34%), 23(27.88%) were in 6 to 10 years age group, 14(17.34%) were under 1 year and 12(13.46%) were in the age group 11 to 12 years. Most of the cases 48(57.6%) belonged to low SES. 19(22.11%) cases revealed positive history of contact with adult case of tuberculosis. The present study shows predominant symptoms of presentation are Fever 78(65.38%) and cough 70 (58.65%). One third had weight loss or poor weight gain, Significant lymphadenopathy was observed in 32(26.92%). 67(55.76%) has protein energy malnutrition (PEM) and 53(44.23%) cases had normal nutritional status. **Conclusion:** Maximum number of cases were in the 1 to 5 years age group 35 (41.34%). For each new cases of childhood Tb detected, the possibility of open adult contact is 22.11%. Our study reveals that protective benefit of BCG vaccine against the dissemination of tuberculosis in children is possible only if they have normal nutrition and favourable socioeconomic conditions.

**Keywords:** Tuberculosis; BCG; Socioeconomic status; Nutrition.

**Introduction**

In Sanskrit tuberculosis is known as King's evil, "Rajyakshma". Tuberculosis is disease that continues to plague mankind in spite of the fact that its etiology has been known for more than a century and effective means of treatment have been available for more than half century. Tuberculosis (TB) remains a major public health problem, despite noteworthy socio-economic development and advances in medical science. It is a curable disease but still millions of people suffer every year and a number of them die from this infectious disease, resulting in devastating social and economic impact. TB treatment requires several months of

swallowing a combination of 3 to 4 drugs every day. Patients often forget to take their medicines or stop taking them when they start to feel better. Globally it has been estimated that 1.9 billion people (1/3 of world's population) are infected and 5000 people die of Tb Globally each day.<sup>1</sup> Out of which 95% are in the developing world. About 3 million cases die every year with an addition of 4-5 million new cases every year.<sup>2</sup> The majority of infected individuals live in South East Asian regions. More than 90% of deaths are reported to occur in low-income countries. In India 1.8 million new cases annually accounting for one fifth of new cases. Two of every 5 persons (>400 million) in general population have latent tuberculosis.<sup>3</sup> Tuberculosis is known to be

a major cause of morbidity and mortality throughout the world. For several decades it has been the neglected disease in both industrialized and developing countries specially in children because of the difficulty of confirming the diagnosis. The Global burden of childhood Tuberculosis in the world is unclear. Another important reason is that children do not make a significant contribution to the spread of tuberculosis.<sup>4</sup> After the implementation of expanded and universal immunization programmes in India, there is substantial improvement in BCG vaccination coverage reaching up to 90% in urban areas.<sup>5</sup> In spite of this improved vaccination coverage and timely revised treatment protocols the disease is still rampant, and multidrug resistant strains tuberculosis (MDRTB) have under debate.<sup>6,7</sup>

#### *Aims and Objectives*

1. To study the clinical presentation of Tuberculosis in BCG vaccinated children aged between 2 months-12 years.
2. To study the influence of malnutrition in development of Tuberculosis in BCG vaccinated children.

#### **Materials and Methods**

It is a Prospective Observational Study and done over a period of 11 month. Children in the age group from 2 months to 12 years attending the Outpatient Department, admitted in the wards or in the PICU at our tertiary care hospital with symptoms suggestive of Tuberculous disease were subjected for detailed evaluation. Asymptomatic children close contact with adult Tuberculous patients were also investigated and included in the study if found to have Tuberculous disease. All had BCG vaccination and the presence of BCG scar were included in this study. In the history details regarding familial and extra familial contact with TB was enquired apart from the details of the ill-ness. Socioeconomic status was assessed by modified method of Kuppaswami 100. Nutritional assessment was done according to IAP classification. Patients were followed up at monthly intervals. During each visit they were clinically assessed for nutritional status, clinical improvement and evidence of any drug toxicity. All the family members with symptoms were screened with chest X-ray to exclude intra familial contact. Siblings of index cases were screened with Mantoux test and chest X-ray to exclude asymptomatic Tuberculous disease. New cases after family screening were also included in the study.

#### *Inclusion criteria*

- Recurrent or prolonged fever
- Recurrent respiratory infections
- Recurrent wheezing
- Poor weight gain
- Lymphadenopathy
- Convulsions
- Babies not thriving well.

#### *Exclusion criteria*

- Asymptomatic Mantoux positive children with no evidence of disease,
- Babies less than 2 months of age,
- Children with BCG adenitis,
- Those without BCG vaccination or Scar,
- Those on empirical anti-tubercular drugs were excluded from the study.

#### **Results**

Study was done on 120 patients.

##### *Sex Distribution:*

Sex	No of cases	Percentage
Male	61	50.96
Female	59	49.04
Total	120	100

##### *Age distribution:*

Age group	No of cases	Percentage
<1 year	21	17.3
1 to 5 years	50	41.34
6 to 10 years	33	27.88
11 to 12 years	16	13.46
Total	120	100

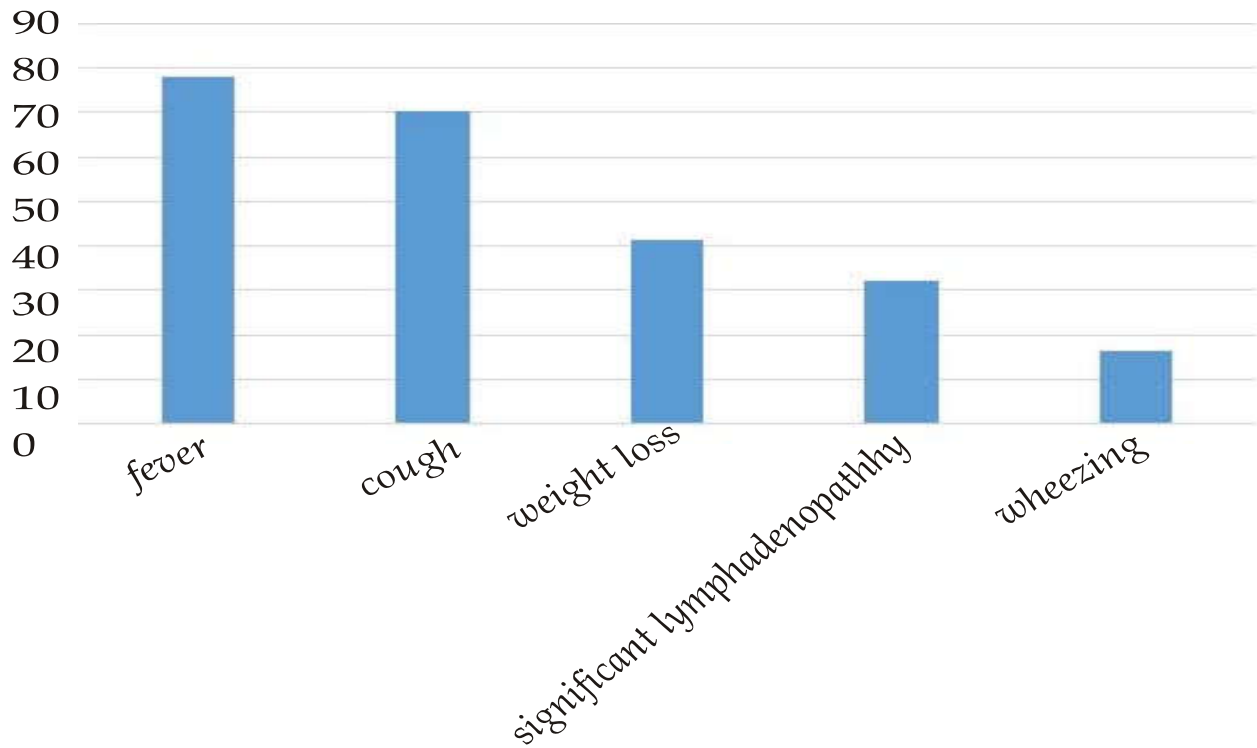
##### *Socioeconomic status:*

Low SE status	No of cases	Percentage
Middle SE status	69	57.69
High SE status	43	35.57
Total	8	6.73
	120	100

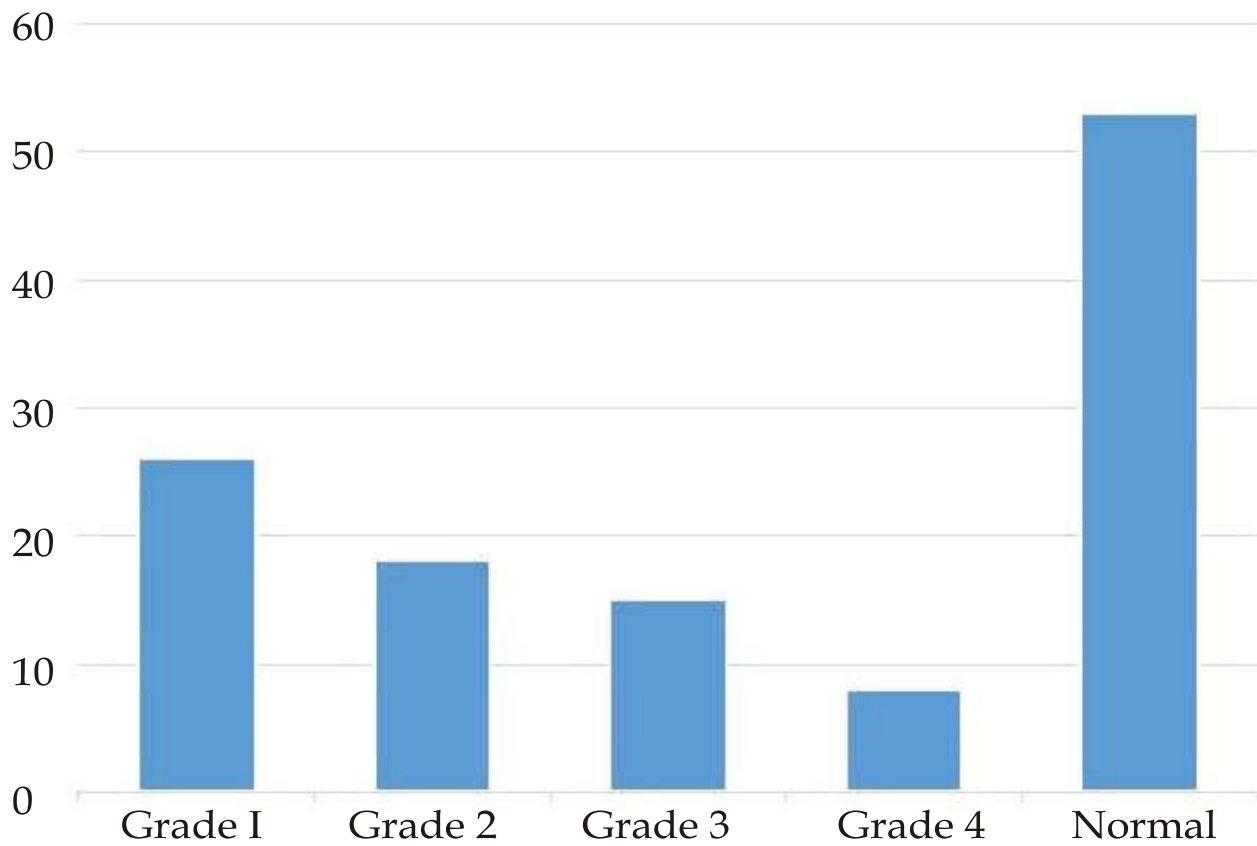
#### **Discussion**

Tuberculosis has traditionally been considered a 'disease of poverty', the reason for the association being the increased risk of exposure to *Mycobacterium tuberculosis* due to crowding.

### Clinical Present



### Nutritional Status



However, even in a homogeneously poor community, tuberculosis is demonstrably associated with socioeconomic factors indicating 'relative' disadvantage.<sup>8</sup>

Udani in his study on 2000 BCG vaccinated children with tuberculosis has observed that 91% has intrathoracic lesions with majority having mediastinal lymph node tuberculosis.<sup>9</sup> The incidence of neurotuberculosis and other type of disseminated tuberculosis were 45% each in his study with modified clinical pictures of neuro tuberculosis serous Tuberculous meningitis and localized Tuberculous disease in meninges and brain.<sup>10</sup>

In the present study, 78.84% had intra-thoracic lesions alone, 33.65% had disseminated TB, 5.76% had isolated lymph node TB and Nearly 1% had hypersensitivity phenomena. Mediastinal lymph node TB, modified neuro TB and other forms of TB described by Udani were not observed.

In under-nourished children, cell mediated immunity is greatly impaired and hence the vaccine fails in preventing dissemination of tuberculosis. The ICMR BCG trials in Chingleput also report that BCG offers no protection against primary tubercular infection or its progression to severe forms.<sup>13</sup> Presently, BCG vaccination is advised to be continued in infants and children to reduce the risk of primary tubercular infection disseminating to severe forms.<sup>13</sup>

### Conclusion:

TB occur in properly BCG vaccinated children. Maximum number of cases were in the 1 to 5 years age group 50(41.34%). For each new cases of childhood Tb detected, the possibility of open adult contact is 22.11% so tracing of the contact Cases should be mandatory. In the present study, 67(55.76%) had protein energy malnutrition (PEM). Our study reveals that protective benefit of BCG vaccine against the dissemination of tuberculosis in children is possible only if they have normal nutrition and probably with favourable socio-economic conditions. this will clearly enlightening the importance of the nutrition and socio economical status which should be improved.<sup>11,12</sup> All supplementary nutritional programmes of the Government may be followed to see that the targeted population is covered and benefitted by the nutritional programmes which may in turn reduce the number of new cases occurring among

the under five population. Early diagnosis of adult type of tuberculosis and following these cases for completion of the drug regime will go a long way in preventing childhood tuberculosis.

### References

1. Global tuberculosis control; surveillance, planning, financing. WHO report 2006. Geneva: World Health Organization, 2006. (WHO/HTM/TB2006.362) (Accessed september1, 2007, at [http://www.who.int/th/publications/global\\_report/2006/pdf/full\\_report.pdf](http://www.who.int/th/publications/global_report/2006/pdf/full_report.pdf)).
2. Editorial - tuberculosis in the Third World: Thorax 1991; 46:689-91.
3. India TB. 2006 RNTCP status report. New Delhi, India: Central TB Family Welfare, 2000 (Accessed september1, 2007, at <http://www.tbcindia.org>).
4. Chauhan LS, Arora VK et al. Management of Pediatric Tuberculosis Under the Revised National Tuberculosis Control Programme. India J Pediatr 2004;71:341-43.
5. Bharadwaj AK, Bharadwaj PK, Gupta BP, et al. Factors influencing immunization status of urban and rural children in Delhi, Indian J Med Res 1990;15:150-84.
6. Tuberculosis Prevention Trial, Madras. Trial of BCG vaccine in South India for tuberculosis prevention. Indian J Med Res 1980;72 (suppl):1-70.
7. Mathur GP, Mathur S, Gupa V, et al. tuberculosis in children with reference to their immunization status: A hospital bases study. Indian Pediatrics 1990; 28:569-570.
8. Van Rie A, Beyers N, Gie RP, et al. Childhood tuberculosis in an urban Population in South Africa: burden and risk factor. Arch CD is Child 1999;80: 433-37.
9. Udani PM. BDg vaccination in India and tuberculosis in children, Indian J.Pediatr 1994;61:451-62.
10. Udani PM. BCG vaccination and child neurology from modern perspectives of child neurology. In: Proceedings of the Joint Convention of the 5th International Congress and 3<sup>rd</sup> Asian and Oceanian Congress of Child Neurology. Tokyo No 4-9, 1990 Jap Ped Neurol Soc 1991;14.
11. Magoatr ML, Andurkar GP, et al. Primary Pulmonary tuberculosis in children. Indian pediatr 1974;11:529-523. 89
12. Shah RH. Ramakrishna B, Mehta DK, et al. Pulmonary tuberculosis in Ahmedabar Epidemiology, diagnosis and short course chemotherapy. Indian J Pediatr 1992;59:435-42.
13. John TJ et al. Tuberculosis control, without protection from BCG. Indian Pediatrics 2000;37:9-18.