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Clinical Spectrum of Tuberculosis in BCG Vaccinated Children

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Abstract: ***Objectives: This study was undertaken to evaluate the clinical spectrum of Tuberculosis in properly BCG vaccinated children in age group of 2months to 12 years. 1. To study the clinical presentation of Tuberculosis in BCG vaccinated children aged between 2 months-12 years. 2. To study the various complications and sequelae of the disease. Methods: This prospective study was conducted in the Department of Pediatrics-Children in the age group from 2 months to 12 years attending the Outpatient Department, admitted in the wards or in the PICU 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 with BCG scar were included in this study. Results: 159 children who fulfilled the diagnostic criteria for Tuberculous disease were initially included in the study but final analysis was done in only 104patients who could be completely followed up. Maximum number of cases were in the 1 to 5 years age group 43 (41.34%), 29 (27.88%) were in 6 to 10 years age group, 18 (17.34%) were under I year and 14 (13.46%) were in the age group 11 to 12 years. The present study shows predominant symptoms of presentation are Fever 68 (65.38%) and cough 61 (58.65%). 38 (36.53) had initial presentation as seizures. One third had weight loss or poor weight gain, Significant lymph-adenopathy was observed in 28 (26.92% 0 cases and 14 (13.46% 0 has wheezing. Statistically significant relation was observed between severe forms of tuberculosis and PEM. Conclusion: All types of TB occur in properly BCG vaccinated children and 33.65% progress to severe disseminated forms. Maximum number of cases were in the 1 to 5 years age group 43 (41.34%). 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 improved socio-economic conditions.***

Keywords: Tuberculosis, BCG, Socio economic status, Nutrition

1. Introduction

- In Sanskrit tuberculosis is known as King's evil, "Rajyakshma".
- It is the most frequent cause of death from a single agent in the world being second only to AIDS are equivalent to the crash a jumbo jet every hour of everyday. 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 day1
- More than 90% of deaths are reported to occur in low-income countries.
- Tuberculosis long known to be a major cause of morbidity and mortality throughout the world has for the several decades been a neglected disease in both industrialized and developing countries specially in children because of the difficulty of confirming the diagnosis.
- Children can present with TB at any age, but the majority of cases present between 1 and 4 years.
- Disease usually develops within one year of infection. In younger individuals the progression to disease is earlier and is more disseminated. Pulmonary tuberculosis (PTB) is usually smear negative.

2. Aim & Objectives

Aim:
This study was undertaken to evaluate the clinical spectrum of Tuberculosis in properly BCG vaccinated children in age group of 2months to 12 years.

Objectives:

- To study the clinical presentation of Tuberculosis in BCG vaccinated children aged between 2 months-12 years.
- To study the influence of malnutrition in development of Tuberculosis in BCG vaccinated children.
- To study the various complications and sequelae of the disease.

3. Methods

Sample Size: 104
This prospective study was conducted in the Department of Pediatrics – GSL Medical College Hospital, Rajmhundry from May 2021 to May 2022.

Inclusion Criteria:
All had BCG vaccination and the presence of BCG scars was included in this study.

The clinical criteria for inclusion in to this study
1) Recurrent or prolonged fever
2) Recurrent respiratory infections
3) Poor weight gain
4) Lymphadenopathy
5) Convulsions
6) Serous effusions
7) Babies not thriving well

Exclusion Criteria
1) Asymptomatic Mantoux positive children with no evidence of disease,
2) Babies less than 2 months of age,
3) Children with BCG adenitis,

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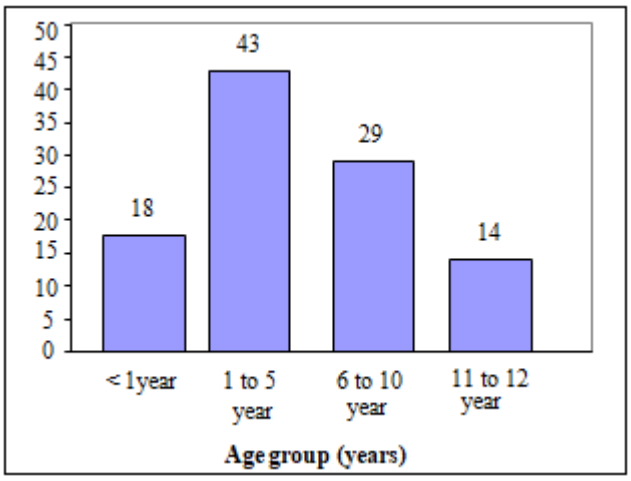
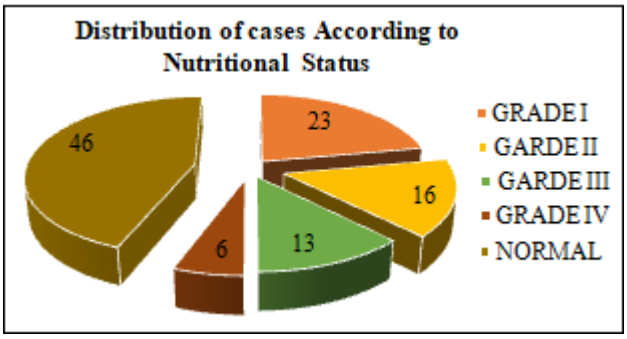
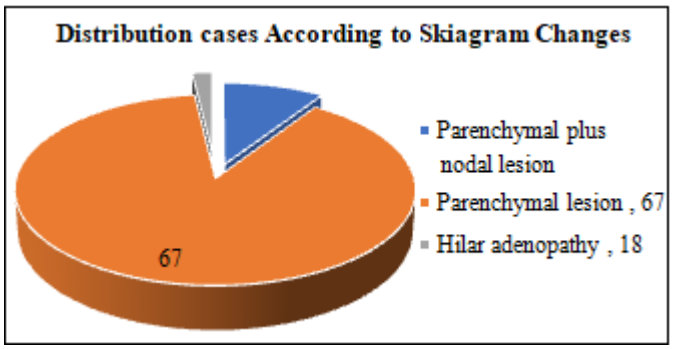
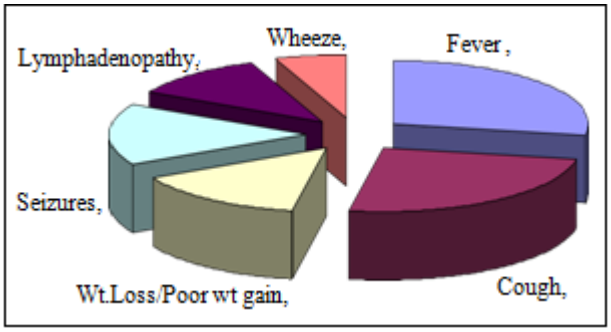
4) Those without BCG vaccination or Scar,
5) Those on empirical anti-tubercular drugs were excluded from the study.

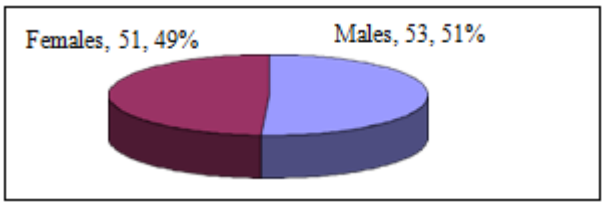
- **104** children who fulfilled the diagnostic criteria for Tuberculous disease were included in the study. . Maximum number of cases were in the 1 to 5 years age group 43 (41.34%), 29 (27.88%) were in 6 to 10 years age group, 18 (17.34%) were under I year and 14 (13.46%) were in the age group 11 to 12 years
- Most of the cases 60 (57.6%) belonged to low SES, 37 (35.5%) to middle SES and 7 (6.7%) to High socio-economic status.
- Predominant symptoms of presentation are Fever 68 (65.38%) and cough 61 (58.65%).38 (36.53) had initial presentation as seizures. One third had weight loss or poor weight gain, Significant lymphadenopathy was observed in 28 (26.92%0 cases and 14 (13.46%0 has wheezing.
- 58 (55.76%) has protein energy malnutrition (PEM), of which 23 (22.11%) has Grade I, 16 (15.38%) had Grade II PEM, 13 (12.5%) had Grade III PEM. Statistically significant relation was observed between severe forms of tuberculosis and PEM
- Abnormal chest x ray was seen in 92 cases. The commonest radiological abnormality was parenchymal lesion 67 (64.42%), hilar adenopathy 18 (17.30%) and parenchymal plus nodal lesion 7 (6.73%)
- Most common type of tuberculosis was primary pulmonary complex occurring alone 50.96 or in combination with other lesions.35 (33.65%) had disseminated.

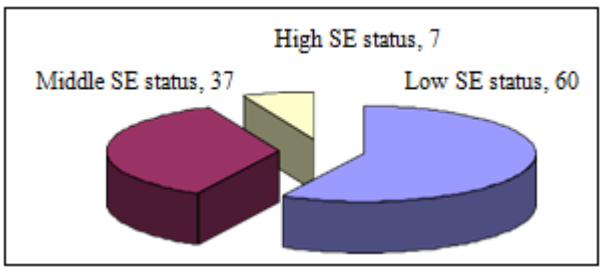












4. Conclusion & Limitations

- All types of TB occur in properly BCG vaccinated children and 33.65% progress to sever disseminated forms.
- Maximum number of cases was in the 1 to 5 years age group 43 (41.34%0,
- 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 in possible only if they have normal nutrition and probably with improved socio-economic conditions.
- 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
- In the present study, 58 (55.76%) had protein energy malnutrition (PEM).44 cases (42.30%) did not have anemia whereas 22 cases (21.15) and 12 cases (11.53%) had moderate and severe anemia respectively.

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- 12 cases of PPC developed respiratory distress as a complication and 10 cases of PPC later developed pleural effusion.
- 2 cases of TBM developed hydrocephalus as a complication.1 case of abdominal tuberculosis developed perotinitis as a complication of the disease.
- In age wise distribution of cases and distribution of cases according to nutritional status P value was less than 0.05.

5. Discussion

- 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. A control study to compare 68 the percentage of different forms of TB in BCG non vaccinated group was not studied.
- All cases of disseminated TB in our study were seen in children with PEM and in those belonging to low socio economic group. Various studies reveal the association between low socio-economic status and severe forms of TB.
- The impact of under nutrition on childhood tuberculosis progressing to severe and disseminated forms was not evaluated in these series whereas in the present study, 58 (55.76%) had protein energy malnutrition (PEM).44 cases (42.30%) did not have anemia whereas 22 cases (21.15) and 12 cases (11.53%) had moderate and severe anemia respectively.
- 44 cases (42.30%) did not have anemia whereas 22 cases (21.15) and 12 cases (11.53%) had moderate and severe anemia respectively.
- Out of 104 case 60 (57.69%) tested positive for tuberculin test, 92 cases (88.46%) had X-ray changes.12 cases had radiological features in CT brain. Gastric aspirate for AFB was negative in our study.
- Abnormal chest X-ray was seen in 92 cases. The commonest radiological abnormality was parenchymal lesion 67 (64.42%), hilar adenopathy 18 (17.30%) and parenchymal plus nodal lesion 7 (6.73%0. The other patients without any skiagram changes had gland TB proved by FNAC.
- 46 (44.23%) case of PPC did not have significant history of contact whereas 7 (6.73%) cases of PPC had a history of contact.12 (11.53%) cases of tuberculoma revealed negative history of tuberculosis.
- 12 cases of PPC developed respiratory distress as a complication and 10 cases of PPC later developed pleural effusion.
- 2 cases of TBM developed hydrocephalus as a complication.1 case of abdominal tuberculosis developed perotinitis as a complication of the disease.3 cases of lymphnode tuberculosis with PPC developed respiratory distress and 1 case developed pleural effusion

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