Study of assessment of nutritional status of tuberculosis children in Rural Population

Bhagyashri Bora*, S.Khose** , Sahil Bansal***

Abstract

Introduction: *Screening and contact tracing of children who are household contacts of adult tuberculosis (TB) cases is universally recommended by WHO, National TB control program but rarely implemented in TB endemic setting.*

Material and methods: *All the contact aged less than 6 years of sputum positive adult patients diagnosed at RNTCP DOTS centre.*

The study was conducted in the department of paediatrics, tertiary care for two years duration.

Results: *All children in either of the gender having disease were having malnourishment. Nutritional status of female diseased children in 33.3% was MAM and 66.7% had SAM. Of male disease children, 66.7% had MAM and 33.3% had SAM. There was statistically no significant ($p>0.05$) difference of the nutritional status within the gender of diseased children.*

In female TB contact children infected with TB, 65.3% had MAM and 13% had SAM. While of 20 male TB contact children infected with TB, 55% had MAM and 25% had SAM. There was statistically no significant difference of the nutritional status of the TB infected contact children in their gender .

Conclusion: *Nutritional status is found important as malnourished child are more prone to infection or disease.*

Introduction

Screening and contact tracing of of children who are household contacts of adult tuberculosis (TB) cases is universally recommended by WHO, National TB control program but rarely implemented in TB endemic setting.[1] TB infection is common among child contacts under 15 years of age (24.4– 69.2%) and was higher than the prevalence of TB disease, which varied from 3.3% to 5.5%.No age is exempt but frequency of infection with tubercular bacilli increase with child's age .Malnutrition, immunodeficiency eg, HIV, after the attack of measles or whooping cough increase susceptibility. In India over 1 lack children die of tuberculosis every year.[2]

*Associate Professor, **Assistant Professor,
***Senior Resident

Corresponding author:
Dr. S. Khose
Department of Pediatrics, Rural Medical College, Pravara Institute of Medical Sciences, Loni, India

As per India's Revised National Tuberculosis Control Programme (RNTCP) guidelines, all household contacts of sputum smear positive pulmonary tuberculosis (PTB) patients are to be screened for TB disease. In the absence of active TB disease, contacts aged less than 6 years are advised for 6 months of daily INH prophylactic therapy (with 10 mg INH per Kg body weight per day).[3]Screening and management of child contact has great potential to reduced TB related morbidity and mortality.

A sputum smear positive PTB patient is defined as ¯A patient with at least 2 initial sputum smear examinations (direct smear microscopy) positive for acid-fast bacilli (AFB); A patient with one sputum examination positive for AFB and radiographic abnormalities consistent with active pulmonary TB as determined by the treating Medical Officer.[4] **A household contact for this study is defined** as ¯a child aged less than 6years of age who lives or has lived (irrespective of the duration) within the household of the smear positive PTB patient during the course

of his/her disease (after the onset of symptoms) and till the end of treatment[5].

Material and methods

All the contact aged less than 6 years of sputum positive adult patients diagnosed at RNTCP DOTS centre.

The study was conducted in the department of paediatrics, tertiary care for two years duration.

Sample size:-Include all the contacts aged <6yrs children of sputum positive adults

during the study period .

Type of study: – Descriptive, cross-sectional.

Inclusion criteria: -Children under the age of 6years who are household contacts of sputum positive adults.

Exclusion criteria: –

1. Past history of taking Anti tubercular therapy.

2. Not willing to participate.

METHODOLOGY

All the contact aged less than 6 years of sputum positive adult patients diagnosed at RNTCP DOTS centre was taken in the study & to detect TB infection or disease. Children under the age of 6 years who were household contacts of diagnosed adults with pulmonary tuberculosis constituted the study population. Household contact was defined as a child living in the same house as the adult patient.

Height and weight measurements were made by a single observer.

Height was measured using a stadiometer (erect position for children older than 2 years length by infantometer for less than 2 year of age.

Weight was recorded using a single electronic weighing machine.

Mid upper arm circumference :

1) For children 6 months to 5yr.

2) Determine midpoint on arm midway between acromion and olecranon.

3) Left arm loosely held by side of child.

4) Crossed tape method .

5) No skin indentation.

Results

Table I: Age Groups of children in contact with adult sputum positive Tuberculosis patients. (n=86)

AGE GROUP	NO'S. OF PATIENTS	PERCENT
0 to 6 months	1	1.2
6 months to 2 yrs	11	12.8
2 to 4 yrs	31	36.0
4 to 6 yrs	43	50.0
Total	86	100.0

In present study out of 86 children's in contact with adult sputum positive Tuberculosis patients, maximum i.e. 50% were within 4 to 6 years age group and 36% were in 2 to 4 year age. Also few childrens i.e 12.8% were within 6 months to 2 years age group and 1.2% i.e 1 child was less than 6 months old.

Table II: Gender of children in contact with adult sputum positive Tuberculosis patients. (n=86)

GENDER	NO'S. OF PATIENTS	PERCENT
Male	44	51.2
Female	42	48.8
Total	86	100.0

Of 86 children's 51.2% were male and 48.8% were female with male to female ratio of 1.04:1.

Table III : Nutritional status of children (n=86) in contact with adult sputum positive Tuberculosis patients.

NUTRITION	NO'S. OF PATIENTS	PERCENT
MAM	38	44.2%
SAM	11	12.8%
Normal	37	43.0%
Total	86	100

Nutritional status of 44.2% children was MAM, 12.8% had SAM and 43% had normal nutritional status. Nutrition of Children above 5-6 year of age were categorized by WHO BMI Index ,there were 16 children who was having BMI index equal or more than median (50th percentile) hence they were considered as normal nutrition.

Table IV: Nutritional status within gender of children (n=86) in contact with adult sputum positive Tuberculosis patients.

NUTRITION	GENDER		TOTAL
	FEMALE	MALE	
MAM	22	16	38
52.4%	36.4%	44.2%	
SAM	5	6	11
11.9%	13.6%	12.8%	
Normal	15	22	37
35.7%	50.0%	43.0%	
Total	42	44	86
100.0%	100.0%	100.0%	

Chi-Square Tests: ÷2 value=2.317, df=2, p value=0.314 In female children contacts, 52.4% were having MAM and 11.9% had SAM while in male child contacts with TB patients, 36.4% had MAM and 13.6% had SAM. There was statistically no significant (p>0.05) difference of malnutrition status in between the gender of the TB contact children.

Table V: Gender according to Nutritional status of diseased children (n=6) in contact with adult sputum positive Tuberculosis patients.

NUTRITION OF DISEASED	GENDER		TOTAL
	FEMALE	MALE	
MAM	1	2	3
33.3%	66.7%	50.0%	
SAM	2	1	3
66.7%	33.3%	50.0%	
Total	3	3	6
100.0%	100.0%	100.0%	

Chi-Square Tests: ÷2 value =0.667, df-1, p value=0.414.

Fisher's Exact Test; p value=1

All children in either of the gender having disease were having malnourishment. Nutritional status of female diseased children in 33.3% was MAM and 66.7% had SAM. Of male disease children, 66.7% had MAM and 33.3% had SAM. There was statistically no significant (p>0.05) difference of the nutritional status within the gender of diseased children.

In female TB contact children infected with TB, 65.3% had MAM and 13% had SAM. While of 20 male TB contact children infected with TB, 55% had MAM and 25% had SAM. There was statistically no significant difference of the nutritional status of the TB infected contact children in their gender .

42.1% out of 38 MAM children were anemic while in SAM children 54.5% were anemic, while anemia was noted only in 10.8% children with normal nourishment. There was statistically highly significant (p<0.01) difference of the anemia in children with MAM and SAM than those with normal nourishment children having contact with adult sputum positive TB patients.

Discussion

India has one of the highest tuberculosis (TB) burdens globally, accounting for 20% of the new 8.6 million TB cases annually .While the burden of childhood TB in India is not known, regional data from the World Health Organization WHO) indicate that sputum microscopy smear-positive TB in children (<14 years old) accounts for 0.6%–3.6% of all reported cases. However, because the majority of children are sputum microscopy smear negative, these data underestimate the true burden of childhood TB. It is estimated that childhood TB constitutes 10–20% of all TB in high burden countries, accounting for 8–20% of TB-related deaths. The epidemiology of TB in young children (<5 years old),a vulnerable population where diagnosis and treatment are most

challenging.[6]

In our study there was 86 children ,out of which 49 children had malnutrition i.e 56.9%, malnutrition was classified by IAP classification **, no malnutrition** in 28.6%, **mild malnutrition** =55.8%, **severe malnutrition** = 15.7%. Whereas, In study of M.sigh129 , this study was about the prevalence of tuberculosis infection among children in household contact with adults having pulmonary tuberculosis, and identify the possible risk factors .malnutrition was important risk factor, all the children was classified as per IAP classification , **no malnutrition =**34.2%, **mild malnutrition=** 39.1%**,severe malnutrition** =26.7%.

Conclusion

Nutritional status is found important as malnourished child are more prone to infection or disease.

References

1. Conde MB, Loivos AC, Rezende VM, et al. Yield of sputum induction in the diagnosis of pleural tuberculosis. Am J RespirCrit Care Med 2003; 167:723—5.
2. Hutton MD, Stead WW, Cauthen GM, Bloch AB, Ewing WM. Nosocomial transmission of tuberculosis associated with a draining abscess. J Infect Dis 1990;

   a. 161:286—95.
3. Templeton GL, Illing LA, et.al. The risk for transmission of Mycobacterium tuberculosis at the bedside and during autopsy. Ann Intern Med 1995;122:922—5.
4. Sterling TR, Pope DS, Bishai WR, Harrington S, Gershon RR, Chaisson RE. , Transmission of Mycobacterium tuberculosis from a cadaver to an embalmer. N , Engl J Med 2000; 342:246—8.
5. Lauzardo M, Lee P, Duncan H, Hale Y. Transmission of Mycobacterium tuberculosis to a funeral director during routine embalming. Chest 2001; 119:640
6. Catanzaro A. Nosocomial tuberculosis. Am Rev Respir Dis 1982; 125:559—62