ORIGINAL ARTICLE

"MILIARY TUBERCULOSIS IN CHILDREN"

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ADDRESS FOR CORRESPONDANCE

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ABSTRACT

Objective: To study the clinical presentation and laboratory findings in children suffering from miliary tuberculosis.

Design: Observational study

Place and Duration of Study: Pediatrics Department, Bahawal Victoria Hospital, Bahawalpur from June 2007 to December 2008.

Subjects and methods: Children admitted with miliary tuberculosis.

Results: Sixty-two cases were diagnosed over one and half year's period. Out of these 17.74% cases did not complete the follow up (9.68% due to the death and 8.06 not returning back to the health facility) while the rest improved.

Girls were 43.55% while children below I y of age were 19.35%.

Only 14.52% cases were BCG vaccinated. There was history of contact in family in 32.26% cases.

The duration of symptoms was more than one month in 14.51% cases. The common symptoms / signs include fever (93.55%), loss of appetite (72.58%), cough (59.68%), fatigue (43.55%), loss of weight (32.26%), vomiting (20.97%),

irritability (20.97%), respiratory distress (17.74%), diarrhea (14.52%), deterioration of consciousness (12.91%), headache (12.91%), convulsions (6.45%) and night sweat (6.45%). There was history of immune suppression in 11.29% cases. The most common sign elicited was hepatomegaly, present in 87.1% cases, followed by lymphadenopathy in 29.03%; signs of meningeal irritation were present in 14.52%. Most common abnormality in laboratory reports were raised ESR in 83.87% and anemia in 85.48%.

Conclusion: Miliary tuberculosis has nonspecific clinical features.

KEY WORDS

Miliary tuberculosis; Childhood tuberculosis; BCG; meningitis

INTRODUCTION

Pakistan is one of the endemic counties for tuberculosis (TB). Miliary tuberculosis, occurring as a result of widespread hematogenous dissemination of tubercle bacilli during primary infection, is the most severe form. It is often the consequence of a recent primary infection (2-6 months) in children. Miliary tuberculosis is more common in children as compared to adults (1). The incidence of miliary tuberculosis in children varies in different studies (8.3 %-12.5%) of the total pediatric tuberculous patients (1, 2). A study done in Indonesia (3) showed that 90% cases of miliary tuberculosis visited the primary health care clinic several times for 2-3 months but were never diagnosed as suffering from tuberculosis.

There are only a few studies available online on this disease in children (1-7) and none from Pakistan. The purpose of the study is to investigate the clinical and laboratory characteristics, short term outcome and risk factors in a non-HIV area in order to obtain an early diagnosis and treatment of MTB.

SUBJECTS AND METHODS

Children admitted to the Pediatric department, Bahawal Victoria Hospital, Bahawalpur from June 2007 to December 2008 suspected on clinical grounds of having Tuberculosis supplemented by chest radiograph (showing micronodular mottling) by a consultant radiologist were labeled as miliary tuberculosis. Detailed clinical examination including fundoscopy for choroidal tubercles were done Routine investigations including total leucocyte count, hemoglobin, ESR, serum Na, serum ALT, as well as CSF were performed. All patients were treated with isoniazid, rifampicin for nine to twelve months with pyrazinamide and ethambutol (if no associated meningitis) or streptomycin (if associated with meningitis) for the first two months period in doses recommended by WHO (8). Prednisolone 2mg/kg/day in three divided doses was given for one month and then tapered off over next two weeks in cases with associated meningitis or with respiratory distress. All cases were called for follow up for every fifteen days during the study period. These children were followed up for two months.

The demographical characteristics, presenting symptoms, clinical and laboratory features, predisposing factors, complications, prognosis and outcome were recorded.

RESULTS

Sixty-two cases were diagnosed over one and half year's period. The clinical/demographic data of 62 cases is shown in table-I while investigations performed are shown in table-II. Five children showed serum ALT in the range of 51-75u/l; all these children had normal bilirubin levels (<1mg %) at the end of one month. In three of these cases serum ALT came to normal while in the rest two cases it remained unaltered. Eleven children (17.74%) either died in the hospital or lost during [six cases due to the death and five cases not returning back to the health facility]. Meningitis was diagnosed in 10 (16.13%) of admitted cases.

DISCUSSION

Usually military TB is diagnosed in suspected cases by demonstration of micronodular military mottling on a chest radiograph. Conditions like bronchopneumonia, tropical eosinophilia, histoplasmosis, sarcoidosis, pulmonary bilharziasis and papillary thyroid carcinoma with pulmonary metastases (9) may mimic miliary tuberculosis on chest radiograph but these conditions are far less common than TB in this region. We took expert opinion from the radiologist to label the case as miliary tuberculosis. Chest radiograph is unable to diagnose every case of miliary tuberculosis (10), whereas high resolution computerized tomography is more sensitive but we do not have this facility in our institute. Tuberculin test was not performed due to unavailability of the PPD in this area but Myco-Dot test was negative in all the cases. Clinical features in this cohort were nonspecific and resemble to those of other studies done in the other parts of world with a few exceptions as shown in table-III. Due to the nonspecific features of the illness, the doctor may ignore the diagnosis unless specifically thought of. In this cohort, 14.5% children were diagnosed after duration of symptoms more than one month. The fatality rate was high in this study which

may be due to the fact that we included all children who were lost during follow-up as cases with fatal outcome.

CONCLUSION

Miliary tuberculosis is a serious disease in children. It is associated with nonspecific clinical features and in endemic areas like ours, there should be a high index of suspicion in sick children in order not to miss this potentially treatable condition.

Table-I

CLINICAL PRESENTATION/ DEMOGRAPHIC DATA

Total cases 62

Feature	Total cases	%age
Females	27	43.55%
Children below I y of age	12	19.35%
BCG vaccinated	9	14.52%
Contact in family	20	32.26%
Duration of symptoms		
<7days	8	12.91%
7-15 days	15	24.19%
15 days – 1month	30	48.39%
>1m	9	14.51%
Fever	58	93.55%
Cough	37	59.68%
loss of appetite	45	72.58%
loss of weight	20	32.26%
Diarrhea	9	14.52%
Vomiting	13	20.97%
Fatigue	27	43.55%
Respiratory distress	11	17.74%
Night sweat	4	6.45%
Irritability	13	20.97%
Convulsions	4	6.45%
Headache	8	12.91%
Deterioration of consciousness	8	12.91%
Immune suppression Measles/pertussis within	7	11.29%

last 3 months steroids within last 3 months for more than 5 days	6 1	85.7% 14.3%
Hepatomegaly	54	87.1%
Splenomegaly	12	19.35%
Lymphadenopathy	18	29.03%
Signs of meningeal irritation	9	14.52%
Chest finding other than distress	12	19.35%

Table-II

INVESTIGATIONS

Total cases 62

Laboratory finding	Positive cases	%age
Leukocytosis TLC>15000	7	11.29%
Raised ESR>20	52	83.87%
Anemia<11gm	53	85.48%
Serum ALT >50u/l	5	8.06%
Na < 135 mEq/l	4	6.45%
Choroids tubercle	01	1.61%
CSF showing meningitis	10	16.13%

Table-III

COMPARISION WITH OTHER STUDIES

Feature	This study	Hussey et al (1)	Kim et al (2)	Rahajoe NN (3)	Gurkan et al (4)	Kim et al (5)	Tanrıkulu et al (6)	Chung et al (7)
Study period	2006-08	2006-08	1971-80	1981-84	1990-97	1960-69	-	1973-78
Total cases	62	94	88	80	23	84	56	26
Male: Female ratio	1.3:1	-	1.5:1	-	14 : 9	1.4:1	3:2	-
Below I y	19.35%	52%	-	-	21.74%	10.7	-	30.8%
BCG vaccinated	14.52%	88%	14.8%	17.5%	4.35%	0%	14.3%	23.1
Contact in family	32.26%	-	36.3%	51.3%	21.74%	18%	58.9%	23%
Duration of symptoms <7days 7-15 days 15 days – 1month >1m	 12.91% 24.19% 48.39% 14.51%	-	-	-	-	-	-	-
Fever	93.55%	61%	72.7%	97.5%	73.51%	75%	17.9%	42.3%
Cough	59.68%	72%	68.2%	90%	-	51.2%	35.7%	-
loss of appetite	72.58%	40%		81.3%	43.48%	15.4%	35.7%	-
loss of weight	32.26%		54.5%	-	43.48%	-	51.8%	-
Diarrhea	14.52%	33%	-	-	-	27.3%	12.5%	-
Vomiting	20.97%	-	35.2%	-	-	4.7%	14.3%	-
Fatigue	43.55%	-	37.5%	53.8%	-	14.2%	21.4%	-
Respiratory distress	17.74%		-		-	11.9%	12.5%	-

Night sweat	6.45%	-	-	-	-	8.3%	28.6%	-
Irritability	20.97%	-	-	-	-	-	-	-
Convulsions	6.45%	-	-	-	-	9.5%	7.1%	-
Headache	12.91%	-		-	-	8.3%	3.5%	-
Deterioration of consciousness	12.91%	-	-	-	-	-	-	-
Immune suppression Measles/ pertussis within last 3 months steroids within last 3 months for more than 5 days	11.29% 85.7% 14.3%		24.9% 100%	26.25% 100%	8.7% 100%	-	3.6% 100%	-
Hepatomegaly	87.1%	82%	22.7%	55%	39.13%	-	51.8%	53.8%
Splenomegaly	19.35%	54%	22.7%	23.8%	39.13%	-	17.9%	-
Lymphadenopathy	29.03%	46%	39.8%	-	-	7.1%	12.5%	-
Signs of meningeal irritation	14.52%	-	42%	-	-	-	17.9%	-
Chest finding other than Distress	19.35%	-	68.2%	-	-	-	42.9%	42.3%
Leukocytosis	11.29%	-	-	-	-	-	66.1%	-
Raised ESR>20	83.87%	-	-	-	-	-	69.6%	44.4%
Anemia<11gm	85.48%	-	-	-	-	-	57.1%	53.8%
Serum ALT >50u/l	8.06%	-	-	-	-	-	26.8%	-
Na < 135 mEq/l	6.45%	-	-	-	-	-	21.4%	-
Choroids tubercle	1.61%	-	-	5%	-	-	0%	-
CSF showing	16.13%	19%	40.9%	-	30.43%	28%	25%	42.3%

meningitis								
Case fatality	17.74%	14%	10.2%	11.2%	8.7%	12%	7.14%	15.4%

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