Original Research Article

Clinical profile of childhood Tuberculosis in a Tertiary Care Rural Hospital and comparison of efficacy of daily vs. intermittent chemotherapy

Aashish Sethi[1*], Prasad Muley[2]

[1, 2]Department of Pediatrics, SBKS MI & RC, Sumandeep Vidyapeeth, Vadodara, Gujarat, India
[*]Corresponding author email: **dr.aashishsethi@gmail.com**

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Abstract

Introduction: 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. We report the disease course, clinical profile and factors associated with treatment outcome in a tertiary facility of Waghodia.

Materials and methods: The study was carried out in the Department of Pediatrics at Dhiraj Hospital, Piparia. Recruitment took place from February 2014 to February 2015. The clinical profile of 71 patients was studied and patients were followed up to 6 months to evaluate the treatment outcome.

Results: There was preponderance of males (60.56%, n=43) in study population as compared to females (39.44%, n=28). Most of the patients were belonging to age group of <6 years (32.4%, n=23) and >10 years (38.0%, n=27). Among 6 to 10 years, 21 (29.6%) patients were included in study. Most common form of TB was extra-pulmonary TB (60.56%, n=43) followed by pulmonary TB (39.43%, n=28). Non-specific symptoms like fever (82.5%, n=66) was the commonest presenting symptoms. Other symptoms included cough (33.8%, n=24), altered sensorium (19.71%, n=14), swelling (15.5%, n=11). From all the patient with follow up (n=50), 44 (88.0%) were cured.

Conclusion: Diagnosis of paediatric tuberculosis still continues to be a challenge. In the study TB was more common in extra-pulmonary than pulmonary forms in our setting. Diagnosis was based on a combination of epidemiological and clinical suspicion supported by results of various investigations.

Presence of paediatric TB is an indication of prevalence of TB in that community. Extra pulmonary tuberculosis is more common in pediatric population and comparison of daily vs. intermittent treatment shows similar efficacy.

Key words

Tuberculosis, Clinical Profile, DOTS, TST, Sputum/gastric lavage AFB, Outcome.

Introduction

India is one of the countries most affected by tuberculosis (TB), with approximately sixty thousand new Childhood Tuberculosis cases being notified every year. This is in the range of the expected incidence by WHO report. However considering difficulties in diagnosis of pediatric TB under field condition, the notification rates can be further strengthened [1]. However, the proportion of pediatric TB case detection has variation among the states, which significantly varies from 5-14% in larger states and in Gujarat it is about 6-8% [2].

Despite this huge disease burden, studies of pediatric TB are scantily available both in global and national contexts. However, research on childhood tuberculosis as it relates to better diagnostics is often neglected because of technical difficulties, such as the slow growth in culture, the difficulty of obtaining specimens, and the diverse and relatively nonspecific clinical presentation of tuberculosis in this age group. Researchers often use individually designed criteria for enrollment, diagnostic classifications, and reference standards, thereby hindering the interpretation and comparability of their findings. Reliable data on the clinical profile of all forms of TB amongst children in India are not available. Most surveys conducted have focused on pulmonary TB and no significant studies on extra pulmonary TB esp. on childhood tuberculosis are available.

By keeping all the above facts in mind this study aimed to identify the potential types of tuberculosis presentation and its immediate outcome in rural tertiary level center.

Materials and methods

This was a prospective study of patients (age up to 18 years) attending the out-patient department of Dhiraj Hospital with clinical symptoms and signs suggestive of tuberculosis or failure to thrive who were investigated and diagnosed for TB disease. This tertiary level health care facility is located on the outskirts of Vadodara and is surrounded by suburbs in which most of the patients live. We also receive cases transferred from primary or secondary level hospitals all around the city and country. Patients with congenital Tuberculosis, MDR-Tuberculosis and XDR-Tuberculosis were excluded from the study. After obtaining written informed consent, demographic data, a detailed clinical history, family history of contact with TB disease, and physical examination for each child was recorded. Relevant investigations were done as and when required with consultation with senior pediatrician for the diagnosis of tuberculosis. Sputum examination was done on all the suspected patients in case considering age. In the cases where sputum collection was not feasible then gastric lavage was performed for acid fast bacilli staining (AFB).

Total 71 diagnosed cases of tuberculosis included in study attending Dhiraj General Hospital from February 2014 to February 2015, Patients in the study were started on anti-tuberculosis treatment after classifying them as per RNTCP category. All the patients were started on category I AKT. Thirty four (48%) patients were started on Daily AKT and thirty seven (52%) were started on alternate day therapy under RNTCP. While choosing the type of treatment of tuberculosis each patient's parents were counseled about the both the treatment options and their relative benefits and harms, As

per the patients parents decision they were started on different modalities of treatment (Daily or Intermittent Therapy). All the cases were followed up for at least 6 months after enrollment in the study.

The study was conducted after approval of the institutional ethics committee (Sumandeep Vidyapeeth, Institute Ethics Committee). The study was conducted as per the applicable national guidelines (ICMR, 2006) respecting the elements of research involving human participation, viz. respect for individual, beneficence and justice. Subjects were enrolled only after obtaining written informed consent.

Results

Out of 71 patients, 34 patients (47.9%) were treated with daily private AKT and 37 patients (52.1%) received AKT under DOTS. We could follow up 50 patients (70.4%) and rest all (29.6%, n=21) were lost to follow up due to various reasons such as: Follow up in different state / Change in residential address / Change in contact number / Wrong address.

Table - 1: Demographic, Clinical, Pathological and Radiological Characteristics.

	Pulmonary Koch's n (%)	**CNS Tuberculosis n (%)**	**Abdominal Koch's n (%)**	**TB Lymphadenitis n (%)**	**Skin Tuberculosis n (%)**	**Disseminated Koch's n (%)**	**Miliary TB n (%)**	**Psoas Abscess of Tubercular Origin n (%)**
Total patients	28(39.4%)	17(23.9%)	11(15.5%)	10(14.1%)	2(2.8%)	1(1.4%)	1(1.4%)	1(1.4%)
Age-wise								
<6 years (32.4%)	10(35.7%)	6(35.3%)	1(9.1%)	4(40%)	1(50%)	1(100%)	0	0
6-10 years (29.6%)	6(21.4%)	6(35.3%)	5(45.5%)	2(20%)	0	0	1(100%)	1(100%)
>10 years (38.0%)	12(42.9%)	5(29.4%)	5(45.5%)	4(40%)	1(50%)	0	0	0
Symptoms								
Fever (54.9%)	17(60.7%)	14(82.4%)	5(45.5%)	0	0	1(100%)	1(100%)	1(100%)
Cough (33.8%)	23(82.1%)	0	0	0	0	0	1(100%)	0
Altered Sensorium (19.7%)	0	14(82.4%)	0	0	0	0	0	0
Swelling (15.5%)	0	0	1(9.1%)	10(100%)	0	0	0	0
Vomiting (12.7%)	0	3(17.6%)	6(54.5%)	0	0	0	0	0
Convulsion (12.7%)	0	9(52.9%)	0	0	0	0	0	0
Abdominal Pain (11.3%)	0	1(5.9%)	7(63.6%)	0	0	0	0	0
Cold (5.6%)	3(10.7%)	0	0	0	0	0	1(100%)	0
Breathlessness (2.8%)	2(7.1%)	0	0	0	0	0	0	0
Skin Lesions (2.8%)	0	0	0	0	2(100%)	0	0	0
Contact history								
Present (21.1%)	8(28.6%)	4(23.5%)	1(9.1%)	1(10%)	0	1(100%)	0	0
Absent (78.9%)	20(71.4%)	13(76.5%)	10(90.9%)	9(90%)	2(100%)	0	1(100%)	1(100%)
BCG Vaccination History								

Present (60.6%)	22(78.6%)	5(29.4%)	6(54.5%)	8(80%)	1(50%)	0	0	1(100%)
Absent (39.4%)	6(21.4%)	12(70.6%)	5(45.5%)	2(20%)	1(50%)	1(100%)	1(100%)	0
AFB Examination								
Positive (5.6%)	3(10.7%)	0	0	0	0	0	0	1(100%)
Negative (94.3%)	25(89.3%)	17(100%)	11(100%)	10(100%)	2(100%)	1(100%)	1(100%)	0
Tuberculin Skin Test								
Positive (69%)	21(75%)	9(52.9%)	8(72.7%)	8(80%)	2(100%)	0	0	1(100%)
Negative (31%)	7(25%)	8(47.1%)	3(27.3%)	2(20%)	0	1(100%)	1(100%)	0
Chest X-Ray								
Positive (47.8%)	28(100%)	2(11.8%)	2(18.2%)	0	1(50%)	0	1(100%)	0
Negative (52.2%)	0	15(88.2%)	9(81.8%)	10(100%)	1(50%)	1(100%)	0	1(100%)

Table - 2: Association of TST outcome with nutritional status.

	MT (TST)		
	Positive	**Negative**	**Total**
Malnourished	34(65.4%)	18(34.6%)	52
Normal	15(78.9%)	4(21.1%)	19
Total	49(69%)	22(31%)	71

Average duration of the hospital stay was 7.85 with SD ± 5.54. Minimum 3 days and maximum was 28 days. There was preponderance of males (60.6%, n=43) in study population as compared to females (39.4%, n=28). The male to female ratio was 1.53:1 (**Table – 1**).

Maximum patients were from age group of <6 years (32.4%, n=23) and >10 years (38.0%, n=27). Among 6 to 10 years, 21(29.6%) patients were included in study. The youngest patient was 6 months old and the eldest patient was 17 years old. There was almost equitable distribution of males (16.9%, n=12) and females (15.40%, n=11) in <6 years age group. In other two age groups of 6 to 10 years and >10 years, there was male predominance with 21.1% (n=15) and 22.5% (n=16) respectively (**Table – 1**).

While calculating the spectrum of tuberculosis, Pulmonary koch's was observed to be the most common form of tuberculosis as per organ-wise involvement, however on broad classification extra-pulmonary TB (60.6%, n=43) was more common than pulmonary TB (39.4%, n=28). Out of 49 patients who were diagnosed as extra-pulmonary TB, most common sites were meninges (23.9%, n=17), abdominal (15.49%, n=11) and lymph node (14.0%, n=10).

Symptoms like fever (54.9%, n=39) Cough (33.8%, n=24), Altered sensorium (19.71%, n=14) and malnutrition were the commonest among others in all forms of tuberculosis. In Pulmonary tuberculosis cough (82.1%, n=23) and fever (60.7%, n=17) were common complaints while altered sensorium (82.3%, n=14) was the commonest clinical feature in case of CNS tuberculosis. Patients of TB lymphadenitis were presented with complaints of swelling (100%, n=10) and vomiting was the most common complaint among the patients of abdominal tuberculosis (54.5%, n=6) as per **Table - 1**.

Among the tuberculosis patients ESR was sent for all the patients admitted at Dhiraj General Hospital, 78.87 % had High ESR(>20 mm at 1st hour), which shows that ESR is a sensitive marker for tuberculosis.

All the patients of pulmonary TB (39.4%, n=28) and military TB (1.4%, n=1) had positive chest x-ray. Among the patients of pulmonary

tuberculosis 54% (n=15) presented with chest X-Ray finding of hilar lymphadenopathy, 18% presented with patchy infiltrates and 18% presented with both hilar lymphadenopathy and infiltrates, while 10% presented with cavitatory lesions on Chest X-Ray.

Sputum/Gastric lavage for AFB was done in all patients. AFB was detected from sputum/gastric lavage sample of 4(5.6%) patients. While in 67 (81.2%) patients AFB examination did not yield positive results. In case of psoas abscess of tubercular origin, we were able to identify the acid fast bacilli in pus examination.

Table - 3: Treatment outcome.

	DAMA	**Expired**	**Abscond**	**Cured**	**Failure**	**Loss to Follow up**	**Total**
Treatment							
Daily	3(8.8%)	2(5.9%)	2(5.9%)	22(64.7%)	0	5(14.7%)	34
Intermittent	1(2.7%)	1(2.7%)	0	22(60%)	3(8.1%)	10(27%)	37
Total	4(5.6%)	3(4.2%)	2(2.8%)	44(61.9%)	3(4.2%)	15(21.1%)	71
Final Diagnosis							
Pulmonary Koch's	0	0	1(3.6%)	21(75%)	2(7.1%)	4(14.2%)	28
CNS Tuberculosis	2(11.8%)	3(17.6%)	0	7(41.1%)	1(5.8%)	4(23.5%)	17
Abdominal Koch's	2(18.2%)	0	0	5(45.4%)	0	4(36.4%)	11
TB Lymphadenitis	0	0	1(10%)	7(70%)	0	2(20%)	10
Skin Tuberculosis	0	0	0	2(100%)	0	0	2
Disseminated Koch's	0	0	0	0	0	1(100%)	1
Miliary TB	0	0	0	1(100%)	0	0	1
Psoas Abscess of Tubercular Origin	0	0	0	1(100%)	0	0	1
Total	4(5.6%)	3(4.2%)	2(2.8%)	44(61.9%)	3(4.2%)	15(21.1%)	71

We co-related TST results with nutritional status of patients as shown in **Table - 2**. Nutritional status of all the patients enrolled in the study was assessed as per Weight for age classification after plotting their weight on WHO (for children below 5 years) and IAP growth chart (for children 5-18 years of age). Children with their weight less than -2 SD were taken as malnourished.

Our study shows 65.4% (n=34) patient were TST positive among 52 malnourished patient while 78.9% (n=15) were TST positive among 19 normal nutritional status patient which is suggestive of that mantoux test is still a test of value even in malnourished children

Among pulmonary tuberculosis 39.3% (n=11) were started on daily therapy while 60.7% (n=17) were on intermittent therapy, in case of CNS tuberculosis 76.5% (n=13) patients were started on daily therapy out of total 17 CNS tuberculosis patients. Among abdominal tuberculosis patient 63.6% (n=7) were started on intermittent based therapy out of total 11 patients. 50% (n=5) tubercular lymphadenitis patients were started on daily therapy while 50% on alternate day therapy.

Out of total 34 patients who were receiving daily therapy 50% (n=17) patients were cured, 29.4% (n=10) patients who did not turned up for follow up, telephonic follow up was able to be obtained for 14.7% (n=5) patients and as per the information they have completed the treatment for 6 months and got cured and other 14.7% (n=5) patients couldn't be contacted, 8.8% (n=3) patients left against medical advice, 5.9% (n=2) patient expired and 5.9% (n=2) abscond from hospital (**Table – 3**).

Among other 37 patients receiving intermittent based therapy under RNTCP 27.01% (n=10) patient lost to follow up, 60.0% (n=22) were cured, 2.7% (n=1) left against medical advice and 8.1% (n=3) patient didn't respond to treatment and considered as failure and referred to district TB centre for evaluation of resistance and further management.

Out of pulmonary tuberculosis Patients shows 75.0% (n=21) cured, 7.1% (n=2) failure to respond, 14.2% (n=4) lost to follow up and 3.6% (n=1) patient was abscond. Among the patients of CNS tuberculosis 41.1% (n=7) patients were cured, 5.8% (n=1) failure to respond, 17.66% (n=3) were expired, 11.8% (n=2) patient left against medical advice while 23.5% (n=4) patient were lost to follow up.

Among abdominal tuberculosis patient 45.4% (n=5) patient were cured and 36.4% (n=4) patient were lost to follow up while 18.2% (n=2) left against medical advice. 70% (n=7) patients of tubercular lymphadenitis were cured while 20% (n=2) lost to follow up and 10% (n=1) patient abscond from hospital.

Discussion

In our prospective study conducted at Dhiraj Hospital 71 patients were enrolled for the study. Out of which there was preponderance of males (60.6%) in study population as compared to females (39.4%). The male predominance in the study may be due to their ambulatory nature which make them more expose to the TB infected cases or could be because of more attention given to male child in developing country like India.

Maximum patients were from age group of <6 years and >10 years. In children below 6 year of age, probably there is less developed immunity and similarly adolescent and pre pubertal age group has more exposure to infection. Although the difference between patients from various age groups is not statistically significant in our study perhaps it would have been significant if the sample size was large.

Approximately 40% of infected children less than 1 year of age if left untreated develop radiological significant lymphadenopathy or segmental lesions compared with 24% of children between 1-10 years and 16% of children between 11-15 years of age [3]. Our study supports this concept as we got more patients in younger and adolescent age. Probably young child has less developed immunity and more prone to infection, similarly post pubertal or adolescent were more because of more exposure to infection.

While calculating the spectrum of tuberculosis, Pulmonary koch's was observed to be the most common form of tuberculosis as per organ-wise involvement, however on broad classification extra-pulmonary TB (60.6%) was more common than pulmonary TB (39.4%). A study from Bhutan had 51% patients with extra-pulmonary TB and 49% patients with pulmonary TB and TB lymphadenitis (54%) was most common form of extra-pulmonary TB [4]. A study conducted in Delhi, extra-pulmonary TB was diagnosed in 63.3% and pulmonary TB in 36.7% [5]. Distribution of extra-pulmonary TB according to organ involved in a study by Hatwal D, et al. was TB lymphadenitis (41.3%), TBME (22.4%), pleural effusion (13.7%), musculoskeletal (12%) and abdominal TB (5.2%) [6]. Findings of these studies match with our findings.

Symptoms like fever (54.9%) Cough (33.8%), altered sensorium (19.71%) were the commonest among others in all forms of tuberculosis. In pulmonary tuberculosis cough (82.1%) and fever (60.7%) were common complaints while altered sensorium (82.3%) was the commonest clinical feature in case of CNS tuberculosis. Patients of TB lymphadenitis were presented with complaints of swelling (100%) and vomiting was the most common complaint among the patients of abdominal tuberculosis (54.5%). In a study by Shrestha, et al. had nonspecific symptoms like fever (75.6%), cough (63.4%) and weight loss

(41.5%) as most common presenting symptoms [7]. Study from north India had maximum numbers of children presenting with non-specific symptoms of anorexia (95%) followed by fever (84%), weight loss (63%) and cough (44%) [8]. Another study from Chennai, India had predominant symptoms as fever and cough (47%), loss of weight (41%) and a visible glandular swelling (49%) [9]. Also, in a study done at Philippines, most frequent symptoms were fever (86.6%), cough (76.1%), malnutrition (52.3%), weight loss (50.7%), anorexia (44.8%), and breathing difficulty (28.4%) [10]. This shows nonspecific symptoms are most common presenting features of TB in children, which makes early diagnosis difficult and which requests high degree of suspicion for proper work up.

Patients with pulmonary TB, 75.0% had positive TST while 25.0% had negative TST. In extra pulmonary TB, 65.11% patients had positive TST while 34.88% patients had negative TST. This analysis showed more patients of extra-pulmonary TB had negative TST in comparison to pulmonary TB. Zombini, et al. used TST only in few patients (33.3%) for diagnosis of TB and all the patients had TST positive [11]. Study from Bangalore, India had 23% patients with positive TST [12]. However, this study was done for HIV and TB co infected patients. Of abdominal TB patients 53.1% had positive TST in a study by Shah I, et al. [13]. It is known that negative TST does not rule out TB infection, while utility of positive MT is more in children <5 years. In our study greater proportion of patients had positive TST. This favors the use of TST for the diagnosis of TB.

Among the tuberculosis patients ESR was sent for all the patients admitted at Dhiraj Hospital, 78.87% had High ESR (>20 mm at 1st hour), which shows that ESR is a sensitive marker for tuberculosis. Shamin A, et al. conducted a study at children hospital Islamabad which showed that ESR was raised in 81% children [14]. Findings match to outcome of our study. M.R.H.A. Al-Marri, et al. conducted a study which showed 67% had elevated ESR at time of diagnosis of childhood tuberculosis [15]. This favours the sensitivity of ESR in tuberculosis.

All the patients of pulmonary TB (39.43%) and military TB (1.40%) had positive chest x-ray. Among the patients of pulmonary tuberculosis 54% presented with chest X-Ray finding of hilar lymphadenopathy, 18% presented with infiltrates and 18% presented with both hilar lymphadenopathy and infiltrates, while 10% presented with cavitatory lesions on Chest X-Ray. Chest X ray was normal in 56% patients of bacteriologically proven TB in a study by Swaminathan, et al. [9]. All the patients of extra-pulmonary TB had normal chest X ray in a study done at Uttarakhand[16]. Majority of patients had significant chest X-ray finding and 14% of patients with pulmonary disease had normal chest X-ray in a study by Pama CP, et al. [10]. In these studies consolidation, effusion, hilar lymphadenopathy was common chest X-ray findings, which helps to diagnose pulmonary TB. This shows chest x-ray examination is not sensitive investigation for diagnosis of extra-pulmonary TB.

Sputum/Gastric lavage for AFB was done in all patients. AFB was detected from sputum/gastric lavage sample of 5.6% patients. While in 81.2% patients AFB examination did not yield positive results. Similarly microscopy for AFB was positive in small proportion of children (<20%) in a study by Sreeramareddy CT, et al. [23]. In a study done at Brazil 32.5% showed positive identification of Mycobacterium [19]. Only 14% cases were confirmed (bacteriological or histological) to harbour the disease in study by Garg P, et al. [8].

Contact history was positive in 21.1% patients while remaining 78.9% patients did not have any known contact history of tuberculosis. Patient diagnosed with pulmonary TB 11.3%, TBME 5.6% were having positive contact history. History of contact with patients of active tuberculosis was reported in total 18.2% cases in study done at Sangli, India [16]. Only 23.5%

patients had positive history of contact in study from Nepal [4]. Similarly a history of contact with tuberculosis was given by only 13.1% relatives in north Indian study [8]. Children acquire TB infection from the adults with TB as in children pauci-bacillary TB is common and poor tussive force. Contact history of TB is seldom positive; this could be due to family members not giving true history due to the social stigma attached to this disease. So although mention facts questions the role of history of contact with T.B. as tool for diagnosing tuberculosis but still we consider as important aspect especially in cases of less than 5 years old.

Association of BCG with type of tuberculosis was compared among patients that were enrolled in the study. From patient that were included in the study 60.6% patients were having history of BCG taken while 39.4% had not taken BCG. Sreeramareddy CT, et al. had reported 57.4% with history of receiving BCG [4]. A study done by Pama CP had most patients (56.7%) who had received BCG [10]. All form of TB was seen in patients who had received BCG in our study. Majority of patients diagnosed with pulmonary TB 22 (30.9%), TB lymphadenopathy 8 (11.20%), TBME 5 (7.04%) and abdominal koch's 6 (8.45%) had taken BCG. This indicates that there is still a significant chance of developing TB even in the presence of BCG vaccination but probably as well-known fact it may reduce dissemination of the disease.

Our study shows 73.2 % children were malnourished among the total 71 patients. While comparing the TST results with nutritional status of the patients, 65.4% patient were TST positive among malnourished patient while 78.9% (n=15) were TST positive among normal nutritional status patient which is suggestive of that mantoux test is still a test of value even in malnourished children. In Shrestha, et al., 20 (48.8%) patient had malnutrition and most of children with disseminated tuberculosis had grade III malnutrition [7]. Malnutrition was present in more than half of patients (52.3%) in study from Philippine [10] and patients with extra-pulmonary TB were more malnourished. Sixty two percent patients had grade 3, 4 malnutrition in study done by Swaminathan, et al. [9].

Out of pulmonary tuberculosis Patients shows 75.0% cured, 7.1% failure to respond, 14.2% lost to follow up and 3.6% patient was abscond. Among the patients of CNS tuberculosis 41.1% patients were cured, 5.8% failure to respond, 17.7% were expired , 11.8% patient left against medical advice while 23.5% patient were lost to follow up. Among abdominal tuberculosis patient 45.4% patient were cured and 36.4% patient were lost to follow up while 18.2% left against medical advice. 70% patients of tubercular lymphadenitis were cured while 20% lost to follow up and 10% patients abscond from hospital. In a study by Shrestha S, 24.4% failed to follow up, 2.4% expired, and remaining 73.2% improved but one 2.4% case came with relapse pulmonary tuberculosis after 3 months of completion of treatment [7]. Satyanarayana S, et al. 95% of the patients reported to have been successfully treated, i.e., completed or cured. Other outcomes [defaulted (2.6%), death (1.1%), failure (0.6%), transferred out (0.4%)] were noted in 4.3% of the patients [17]. A study done at Bhutan had 93% overall treatment success rate (cured and treatment completion) and the death and failure rates were <1%[6]. In Sharma S et al the overall success rate was 95.4% and 82.6% for new and retreatment cases, respectively. The rates for default, failure and death in the study were respectively 3%, 1.9% and 1% [18].

Our study shows similar efficacy of both intermittent and daily chemotherapy for childhood tuberculosis. Kumar L, et al. conducted a randomized controlled trial to compare intermittent vs daily short course chemotherapy for childhood tuberculosis and concluded that overall efficacy of both regimens were almost similar and greater than 95% in patients with good compliance [19].

Conclusions

Diagnosis of paediatric tuberculosis still continues to be a challenge. In the study TB was more common in extra-pulmonary than pulmonary forms in our setting. Diagnosis was based on a combination of epidemiological and clinical suspicion supported by results of various investigations. Presence of paediatric TB is an indication of prevalence of TB in that community. Extra pulmonary tuberculosis is more common in pediatric population and comparision of daily vs. intermittent treatment shows similar efficacy.

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