Pattern of Pediatric Tuberculosis: A Study at Tertiary Care Hospital

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ABSTRACT

Objective: To determine the patterns of pediatric tuberculosis at tertiary level hospital.

Study Design: Descriptive / cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Pediatric MTI Hayatabad Medical Complex/Khyber Girls Medical College, Peshawar from January 2018 to September 2018.

Materials and Methods: The study duration was 8 months and a total of 57 patients were included in the study, which fulfilled the inclusion criteria. PPA scoring was used for the diagnosis. 95% confidence level and 7% margin of error using WHO software for sample size. The SPSS latest version was used to analyze the data. For categorical data frequencies and % ages were calculated and the data was presented in tabulated form.

Results: In this study 57 patients with diagnosis of pulmonary or extrapulmonary tuberculosis were included in the study. Male patients were 31 while female were 26 with male to female ration of 1.2:1. New Pulmonary tuberculosis cases were 41, 13 were new extrapulmonary cases while 2 were pulmonary relapse cases. Smear was made in 44 cases and only 13 were smear positive cases.

Conclusion: Pediatric tuberculosis is one of the growing and leading concerns of our region. Pulmonary tuberculosis is still the most common type of pediatric tuberculosis.

Key Words: Pulmonary tuberculosis, Extrapulmonary tuberculosis

INTRODUCTION

Tuberculosis is one of the alarming conditions amongst the infectious diseases. Tuberculosis (TB) is a leading cause of death worldwide. Pakistan ranks sixth globally among the 22 high-TB burden countries and contributes an estimated 43 percent of the disease towards the Eastern Mediterranean region. Annually around 430,000 people including 15,000 children contract tuberculosis in Pakistan and every year no less than 70,000 deaths can be attributed to the disease in the country. Pakistan is also estimated to have the fourth highest prevalence of multi drug resistant tuberculosis (MDR-TB) globally. Over 95 percent of tuberculosis deaths occur in low and middle-income countries[1]. Tuberculosis is definitely considered to be a disease of low socioeconomic r, malnourished region disease. The poor population is mostly living in overcrowded regions so easily in contact and best tool for spreading of the infection [2].

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Another important reason for this long lasting infection is delay in the diagnosis and low awareness in the population of these regions[3]. The delay in diagnosis along with unsupervised, inappropriate and inadequate drug regimens, poor follow up and lack of social support programmes for high-risk population, are some of the reasons for not reaching the target rates and emergence of a drug resistant form of tuberculosis. Almost one third of the world population is infected with this disease [4,5]. Pediatric tuberculosis has become one of the most difficult challenges what the developing world is facing today. Tuberculosis not only manifests as pulmonary one but also as extrapulmonary. The most common extrapulmonary tuberculosis includes lymphadenitis (cervical the most common), tuberculous enteritis, meningitis, Pott's diseases and tuberculous ascites etc. The case load in TB varies from country to country It is as low as 5% in low burden countries to as high as 20-40% in high burden countries. One of the most common reasons for this dilemma is difficulty in confirmation of diagnosis of tuberculosis [6]. Many diagnostic modalities are use for the diagnosis of tuberculosis, but still the disease diagnosis has not been confirmed with easily. Multiple investigations including routine and specific tests are carried out to diagnose pulmonary and extrapulmonary tuberculosis. These include complete blood count (CBC), X-Ray chest, Tuberculin skin test (TST), aspiration fluid examination and gram staining, Imaging like Computed tomography scan (CT Brain) and histopathology and Gene X-pert[6,7]. It is very difficult to obtain good quality respiratory specimen. Most of the pediatric tuberculosis cases

remain undiagnosed and even unreported in many cases. One of the most important diagnostic modality in tuberculosis is smear microscopy [7]. Unluckily the sensitivity of sputum smears microscopy in less than 15%. Culture of mycobacterium tuberculosis is higher in biological samples as compared to smear but overall sensitivity very rarely exceeds 40%. The diagnostic value of Gene X-pert MTB/RIA is comparable to culture in adult patients [8]. Though the modality is expansive but is quick as compared to culture. But again unluckily Gene X-pert is having low diagnostic value in pediatric age group. Therefore, pediatric tuberculosis diagnosis is a big challenge with current available laboratory investigations [9].

Pediatric tuberculosis is big dilemma of current time and of the developing countries. It is becoming one of the leading causes of mortality and morbidity in this age group. Therefore it is not only affecting the generation of a region adversely but also affecting the economy of these regions negatively. The current study was conducted in this context to know about the pattern of the disease in our setup.

MATERIALS AND METHODS

This descriptive study was conducted at the department of pediatrics Khyber Girls Medical College/ Hayatabad Medical Complex Peshawar. The study duration was nine months from January to September 2018. Patients of age group up to fifteen years and either sex were included in the study. Patients of age above fifteen years and with underlying immune deficiencies and other congenital disorder were excluded from the study. Investigations like X-Ray chest, CBC and Tuberculin skin test were done in all cases. PPA scoring chart was used to diagnose as a case of tuberculosis. Other investigations like CT Brain, lymph node biopsy were carried out where needed. Patients were further divided into new pulmonary, new extrapulmonary and relapse cases.

The study was started after permission being taken from ethical committee Khyber Girls Medical College and Hayatabad Medical Complex Peshawar. Patients who fulfilled the inclusion were selected and biodata and relevant information were documented on a proforma. A detailed history was taken followed by comprehensive examination in all cases. In all patients assessment data was entered on PPA scoring chart. The patients with score ≥ 7 were diagnosed as case of tuberculosis. Patients with pulmonary presentation were labeled as pulmonary tuberculosis and those with extrapulmonary presentation were labeled as extrapulmonary ones.

All data was filed and assessed in SPSS. Frequencies and percentages were calculated for categorical variables like gender and the results were presented in tabulated form.

RESULTS

This descriptive cross sectional study was conducted at the department of Child Health Hayatabad Medical Complex, Peshawar. The total number of patients included in the study was 57. We found that the gender distribution i.e. male to female ratio was 1.2: 1 as shown in table 1.

Table No.1: Gender wise distribution of pediatric tuberculosis patients n=57

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	31	54.4	54.4	54.4
	female	26	45.6	45.6	100.0
	Total	57	100.0	100.0	

Table No. 2: Age wise distribution of Pediatric Tuberculosis n=57

Age group in years	No. of Patients	Percent	Valid %age	Cumulative %age
≤ 1 years	7	31.58	31.58	31.58
2-5 years	12	35.09	35.09	66.67
6-10 years	20	21.05	21.05	87.72
11-15 years	18	12.28	12.28	100
Total	57	100	100	

Table No.3: Pattern of Pediatric Tuberculosis n=57

Type of Tuberculosis	No. of Patients	Percent	Valid %age	Cumulative %age
Pulmonary	44	77.19	77.19	77.19
Pulmonary relapse	2	19.30	19.30	96.49
Extrapulmonary	11	3.51	3.51	100
Total	57	100	100	

Table No.4: Pattern of Extrapulmonary Tuberculosis

Type of Extrapulmonary Tuberculosis	No. of Patients	Percent	Valid %age	Cumulative %age
Meningitis	5	45,4	45.4	45.4
Enteritis	4	36.4	36.2	81.8
Lymphadenitis	2	18.2	18.2	100
Total	11	100	100	

In our study we found and classified various types of tuberculosis on the basis of new and relapse and pulmonary or extra-pulmonary type and documented in tabulated form as given in table 2. Pattern of pediatric

pulmonary and extrapulmonary tuberculosis has been given in table number 3 and 4 respectively.

In our study we found and classified various types of tuberculosis on the basis of new and relapse and pulmonary or extra-pulmonary type and documented in tabulated form as given in table 5.

We could not identify mycobacterium tuberculosis in all cases but applied PPA scoring chart for classifying as pulmonary and extra-pulmonary cases. The details are given in table 5.

Table No. 5: Results of the patients with pediatric tuberculosis on evidence and sputum basis n=57

		Frequ-ency	Percent	Valid Percent	Cumulative Percent
Valid	Evidence present	13	22.8	22.8	22.8
	Sputum	44	77.2	77.2	100.0
	Total	57	100.0	100.0	

Smear was sent for examination and to confirm the presence of mycobacterium tuberculosis. The results are given in table 6.

Table No.6: Patients result on the basis smear positivity and negativity and no smear n=57

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Smear negative	33	57.9	57.9	57.9
	Smear positive	11	19.3	19.3	77.2
	No	13	22.8	22.8	100.0
	Total	57	100.0	100.0	

DISCUSSION

Pediatric tuberculosis is one of the important pediatric infectious diseases which is responsible for pediatric mortality and morbidity. In our study we studied 57 patients with age ranging from 1 year to 15 years. In our study we found that the mean age of the patients included in the study was 8.443 years. These results were almost the same as given by two other international studies conducted by Nenavath K et al and Cano APG et al [10,11]. The results were different from a study conducted at Bangladesh by Karim T et al where the mean age of presentation of pediatric patient with tuberculosis was less than five years [12].

The most common type was pulmonary tuberculosis in our study population. The same was the case in other international studies. Brent AJ et al has also documented the same results where he found pulmonary tuberculosis as the most common cause of pediatric age tuberculosis. In our study pulmonary tuberculosis was the most frequently occurring and in all age group but the younger patients that less than 5 years were most commonly suffering from pulmonary tuberculosis. The same was found by Brent et al in his study that is most commonly affected population by pulmonary tuberculosis was age less than 5 years [13].

In our study population tuberculous meningitis was the most common condition among the extrapulmonary type followed by tuberculous enteritis and tuberculous lymphadenitis. The results in this context are given different by different studies. Regarding the most frequently occurring extrapulmonary tuberculosis almost the same results were given by Santos RS et al and Gosai DK et al [14,15]. These findings were not simulating with another study conducted by Hatwal D et al which has documented as tuberculous lymphadenitis is most frequently occurring extrapulmonary tuberculosis [16]. The difference between our findings and that of Hatwal D et al may be due to our admitted and hospitalized patients.

The total number of smear positive TB patients in our study was 13 which constituted almost 23 percent of the study population. The number of smear positive cases have been documented various by different international studies. The smear positive cases have ranged from as low as 23 % to 35 %. A study has documented 28 percent of smear positive cases which is not much different from our study. The pediatric tuberculosis is quite different condition from adult TB and not easily detected by smear.

BCG vaccination was found to be done correctly with positive BCG scar in approximately 52.6 % which is less than other studies documented by other international study by Gupta N et al [18]. Gupta N et al found a total of 86 and 73 % vaccination positivity in pulmonary and extrapulmonary cases respectively in study population being immunized against tuberculosis. The immunization status have varies a lot and has ranged from 57 to 93 percent in different studies [10,11, 19] (Nenavath K et Cano AGP et al, Jain et al). In our study contact with tuberculous patient was almost 38.5% which was different from the findings of international studies given by Goyal A et al[20]. The study findings of Goyal A et al showed contact with patient with active tuberculosis in fifty percent of cases.

CONCLUSION

Pediatric tuberculosis is one of the growing and leading concerns of our region. Pulmonary tuberculosis is still the most common type of pediatric tuberculosis.

Author's Contribution:

Concept & Design of Study:	Muhammad Aqeel Khan
Drafting:	Mukhtar Ahmad
Data Analysis:	Arshia Munir, Muhammad Bilal Khattak
Revisiting Critically:	Muhammad Aqeel Khan, Mukhtar Ahmad

Final Approval of version: Muhammad Aqeel Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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