**ORIGINAL ARTICLE**

# A Retrospective Review of Tuberculosis among Children Admitted at Tertiary Care Center of Lahore, Pakistan

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## ABSTRACT

**Aim:** To determine frequency, types and treatment outcome among children of tuberculosis admitted at a tertiary care center of Lahore, Pakistan.

**Methods:** A retrospective case study was conducted of 175 children aged between 0 – 16 years admitted to Lahore General Hospital, Pakistan from January 2015 to December 2016. Modified Keith Jones score was applied on each patient, those with MKJSC (modified Kenneth Jones Criteria system) less than 7 and those who were already taking ATT were excluded from the study. The patients scoring more than 7 on MKJSC with or without positive AFB or culture were put on 4 drugs during intensification phase than on 2 drugs as continuation therapy. Data was retrieved from medical records on demographics, clinical, laboratory and outcome status.

**Results:** A total number of 175 patients treated for different types of tuberculosis. Out of 175, 69 were male (39.4%) and 106 were female (60.57%). 44 were under five years (35%) and 131 aged between six to sixteen years (74.85%). Pulmonary tuberculosis was present in 85(48.57%) cases, Tuberculous meningitis in 23(13.14%) cases, Abdominal tuberculosis in 33(18.7%) cases and tuberculous lymphadenitis was seen in 12(6.84%) patients while patients with Carries spine were 5(2.85%), with Dissiminated tuberculosis were 9(5,14%), T.B Arthritis 4(2.27%) whereas patients with tuberculosis of skin were 2(1.14%). Overall morbidity was 21% in the year 2015 and 15.44% in 2016.Mortality was 9.61% in the year 2015 and 5.69% in 2016.

**Conclusion:** Tuberculosis among children is an important clinical problem in Pakistan and is frequently under reported.

**Keywords:** Tuberculosis, Pulmonary, Abdominal, Meningitis, Arthritis, Dissiminated.

## INTRODUCTION

History of Mycobacterium Tuberculosis existing in human population dates back to ancient times[1]; however, its pathological and anatomical description were revealed in seventeenth century. World Health Organization (WHO) declared T.B a Global Health Emergency in 1992 when it was present in almost all countries and regions of the world[2]. Despite the profound efforts to control the disease for decades, it remains the seventh leading cause of death globally[3]. WHO estimated a total of 9.27 Million new cases worldwide in 2007 with 13. 7 million prevalent cases and 1.3 million deaths with more than 90% in developing countries. Asia owes 55% of disease burden. Tuberculosis mostly effect the poorest population in the world and contribute to a cycle of poverty as a result of decreased productivity due to long term illness, disability and social stigma[4]. Pakistan stands sixth on the list of 22 high burden tuberculosis countries in the world[5,6]. Owing to late presentation to health care centers makes the diagnosis more challenging especially in children having ageless than 15 years[7]. Under reporting can result even when children do present to health services. Reliable research and surveillance data on childhood tuberculosis is limited in most regions of the world. Despite many efforts a bulk of patients are not picked by community health providers nor are they properly observed. Many special programs like DOTS strategy are striving for a better future regarding prevention and treatment of tuberculosis.

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## PATIENTS AND METHODS

A retrospective study of 175 patients having tuberculosis was conducted at the department of pediatrics Lahore General Hospital Pakistan. Patients registered from January 2015 to December 2016 were included in the case series and their demographics, diagnostic and clinical data was obtained from the departmental medical record system. All the patients were admitted for few days of initial phase of the treatment and continued to be followed in the outpatient follow up clinic designed by the department. Modified Keith Jones Score was applied on each patient. All patients had CBC, ESR, Chest X-rays, Gastric Aspirate/Sputum for AFB and Montoux tuberculin test was done in all cases whereas CSF examination and lymph node biopsy was carried out in certain patients having indication for these tests. Patients having joint swelling,pleural effusion or abdominal ascites had fluid aspirated and analyzed for culture and sensitivity. Those with MKJSC less than 7 or already on treatment of Tuberculosis were excluded from the study. Patient scoring more than 7 on MKJSC with or without positive AFB or culture were put on four drugs (Rifampicin, Isoniazid, Pyrazinamide and Ethambutol) for initial two months and on two drugs (Rifampicin and Isoniazid) for further course of treatment (duration depending upon the type of tuberculosis). All anti tuberculous drugs were provided by the TB Control Center present within the hospital and were followed every month at the TB follow up clinic in OPD.

The variables like age, gender, and type of tuberculosis were calculated. Percentages were calculated for variables. SPSS version 13 was used for statistical analysis. All statistical hypothesis were two sided and p values > .05 were considered statistically significant.

Categorical variables were compared by using Fishers exact test.

## RESULTS

Out of 175 patients of tuberculosis 69 were male and 106 were female with male to female ratio was 1: 1.8. Forty-four (25.1%) were up to 5 years and One hundred thirty-one (74.8%) aged between 6 – 16 years. Distribution according to months of each year 2015 and 2016 is shown in Table number – 1. Distribution according to type of tuberculosis is described in Table 2 & 3. All were given treatment under DOTS program with same drugs and their course is shown in Table – 4. Morbidity was 21% in 2015 and 15.44% in 2016 mostly caused by tuberculous meningitis and dissiminated T.B. Mortality was 9.61% in year 2015 and 5.60% in year 2016. Mortality was due to tuberculous meningitis. There was not a single case detected to be of MDR(Multi Drug Resistance) during the course of treatment.

Table 1: Distribution of patients in year 2015 – 2016

| Month | n ( 2015) | n (2016) |
|---|---|---|
| January | 4 | 4 |
| February | 4 | 4 |
| March | 5 | 15 |
| April | 4 | 11 |
| May | 5 | 12 |
| June | 6 | 12 |
| July | 3 | 11 |
| August | 9 | 8 |
| September | 5 | 13 |
| October | 3 | 15 |
| November | 1 | 8 |
| December | 3 | 10 |
| Total | 52 | 123 |

Table 2: Type of tuberculosis and percentages in total duration of study

| Type of tuberculosis | n | %age |
|---|---|---|
| Pulmonary Tuberculosis | 85 | 48.57 |
| Abdominal Tuberculosis | 33 | 18.8 |
| TBM | 23 | 13.14 |
| T.B Lymph Nodes | 12 | 6.8 |
| Dissimminated T.B | 9 | 5.14 |
| Carries Spine | 5 | 2.85 |
| T.B Arthritis | 4 | 2.28 |
| T.B Skin | 2 | 1.14 |

Table 3 A: Types of tuberculosis and their percentage – 2015

| Type of tuberculosis | n | %age |
|---|---|---|
| Pulmonary Tuberculosis | 28 | 53.84 |
| TBM | 9 | 17.30 |
| Abdominal T.B | 7 | 13.46 |
| Dissiminated T.B | 2 | 3.84 |
| T.B Arthritis | 0 | 0 |
| Tuberculous lymphadenitis | 3 | 5.76 |
| T.B skin | 1 | 1.92 |
| Carries Spine | 2 | 3.84% |

Table 3 B: Types of tuberculosis and their percentage in year 2016

| Type of Tuberculosis | n | %age |
|---|---|---|
| Pulmonary Tuberculosis | 57 | 46.34 |
| TBM | 14 | 11.38 |
| Abdominal TB | 26 | 21.13 |
| Dissiminated TB | 7 | 5.69 |
| TB Arthritis | 4 | 3.25 |
| Tuberculous Lymphadenitis | 9 | 7.31 |
| TB SKIN | 1 | 0.85 |
| Carries spine | 3 | 2.43 |

Table 4: Course of patients at the end of treatment

| Course of patients | Year 2015 | Year 2016 |
|---|---|---|
| Cured | 39(75%) | 105(85.36%) |
| Lost in Follow Up | 2(3.8%) | 3(2.4%) |
| Morbidity | 11(21%) | 19(15.44%) |
| Mortality | 5(9.61%) | 7(5.69%) |
| MDR | 0 | 0 |

## DISCUSSION

Our study showed a rising incidence of tuberculosis in Pakistan as shown by other studies like a research done by S siddique, A Ghaffar and H Sadiq published in JPMA showing an annual rise of about 120,000 new cases and many other researches favour the result[8,9] like the one done by James A Seddon and Delane Shingadia supports the global rise in incidence of tuberculosis. The number of tuberculosis patients has increased from year 2015 to 2016.This increase may be attributed to an increased incidence of tuberculosis, better diagnosis or greater parental attention to T.B[10,11]. Our study shows higher number of females(106 vs 69),a ratio consistent with other studies like one which show sixty five percent of women who required permission to seek health care advice and 54% found it to be stigmatized to have tuberculosis [12,13].We did not study life styles, socioeconomic status or body mass indices of these women, however we can calculate that possible reasons for female preponderance may be social exclusion of women who are mostly homebound and have poor nutritional status than their counter parts, social stigma associated with tuberculosis which discourages women from seeking early medical care[14]. The most prevalent type of tuberculosis is pulmonary T.B owing to the initial site of involvement by the mycobacterium tuberculosis is lung parenchyma or hilar glands and spreads through lymphatics and blood to other body organs[15].our study is supported by the study published in International journal of mycobacteriology vol. 5 showing that pulmonary tuberculosis is the commonest type found in children[16]. Clinical manifestations depend upon the site and burden of infection and host response. The frequency of pulmonary TB in our study was 48.57% in the total duration of two years. The frequency of EPTB (Extra Pulmonary Tuberculosis) cases by site was highest in tuberculous meningitis in year 2015 with a percentage of 17.30% and abdominal tuberculosis in year 2015 having a percentage of 21.13%. Tuberculous meningitis was mostly found in patients aged >5 years. The association of Tuberculous Meningitis with young age is well documented in literature[17]. Infected children aged > 5 years remain

candidates for urgent Chemoprophylaxis and Contact tracing in close households.

Cure rates strictly denote bacterial cure and was found to be 75% in year 2015 with a slight increase in 2016 being 85.36%. A less number of patients lost during the treatment being 3.8% in year 2015 and 2.4% in year 2016 owing to an upgradation of follow up clinics. A close relationship between patient and physician generally ensures continuity of care and good adherence to treatment. This practice was adhered to in principal at follow up clinic, visits were regular and adverse events were monitored that also showed a decline in number of morbidity and mortality in year 2016 as compared to year 2015[20]. Our study had a difference in total duration of treatment with anti-tuberculosis drugs in different types of tuberculosis as six months in pulmonary but 8-12 months in tuberculous meningitis. Further studies are needed to show whether the six - month duration of treatment in TBM is as effective to cure it as 8 – 12 months. There is a need for studying this issue. In actual practice, most physician tend to prescribe longer courses empirically.

A comprehensive research plan is required to estimate disease burden in Pediatric community country wide that should also include screening of all children in a close household contact to prevent the disease rather to treat the disease. Health care providers must remain cognizant of remerging issues such as increasing drug resistance in the country. Furthermore, recommendations should be made to maximize attempts to obtain tissue for histopathology and culture with drug sensitivity testing which is particularly important with the rising trend of drug resistance. Finally, since there seems to be no consensus on length of treatment in extra pulmonary tuberculosis in various sites, it is recommended to conduct large scale studies to determine effective duration of treatment.

## REFERENCES


1. National Tuberculosis Center. Brief History of Tuberculosis. New Jersey: New Jersey Medical School;c1996[update 1996 jul 23]
2. World Health Organization: Highlights of activities from 1989 to1998 World Health Forum 1988;9:441-56
3. World Health Organization, The global burden of disease: 2004 update. World Health Organization, Geneva, Switzerland,2004.
4. World Health Organization .Global tuberculosis control :surveillance, planning, financing. WHO REPORT 2008.ho/htm/tb/2008.393.Geneva,Switzerland:WHO,2008
5. Broekmans J, Caines K, Paluzzi JE. Investing in strategies to reverse the global incidence of TB. London: UN Millenium Project ,United Nations Development Programme;2005
6. Spence DP, Hotchkiss J, Williams CS Davies PD. Tuberculosis and poverty.BMJ 1993;307:759-761
7. Chin JH, Mateen FJ. Childhood Tuberculosis: challenges and advances in diagnosis and treatment.Curr Infectious Disease Control 2013;15(6):631-35(Pub Med)
8. Natinal TB Control Programme(http://www.ntp.gov.pk/about.htm)
9. A De Muynck, S Siddiqi , A Ghaffar,H Sadiq :Tuberculousis control in Pakistan:critical analysis of its implementation JPMA Jan 2001.
10. Julia B. Frieze, Rajendra-Prasad Yadav, Khann Sokhan, Song Ngak Team Bak Khim Examining the quality of childhood tuberculosis diagnosis in Cambodia: a cross-sectional study published in BMC public health in 2017
11. Muhammad KK, Sarfaraz J, Tayyab IM. Factors Affecting Tuberculosis Control :Decision making at the Household level.J Coll Physicians Surg Pak .2003<Vol.13(12):697-700.
12. Agboatwalla M, Kazi GN, Shah SK, Tariq M. Gender perspectives on knowledge and practices regarding tuberculosis in urban and rural areas in Pakistan .East Mediterr Health J.2003 Jul;9(4):732-40.
13. Ahmad M, Aziz S. Pattern of tuberculosis in general practice.J Pak Med Assoc 1998;48:183-4
14. Begum V,de Colombani P,Das Gupta S,S alim AH, Hussain H, Pietroni M et al. Tuberculosis and patient gender in Bangladesh :Sex differences in diagnosis and treatment outcome .Int J Tuberc lung dis 2001;5:604-10
15. Ahmad M,Aziz S.Pattern of tuberculosis in general practice.J Pak Med Assoc 1998;48:183-4
16. Ali Akbar Velayati Tuberculosis in children International Journal of Mycobacteriology Volume 5, Supplement 1, December 2016, Pages S1-S2
17. Vanwell GTJ, Paes BF, Terwee CB , Springer P, Roord JJ, Donald FR et al. Twenty Years of Peadiatric Tuberculous meningitis ;a retrospective cohort study in wetern cape of South Africa 2009,123:el-e8(PubMed)
18. National Tuberculosis Controllers Association. Centers for Disease Control and prevention (cdc) guidelines for the investigations of contacts of persons with infectious tuberculosis recommendations from the national tuberculosis controller association and CDC.MMNR Recom Rep.2005;54(RR-15)1-47(Pub Med)
19. Devan Jaganath, Sarah Zalwango, Brenda Okware, and 6etal. Contact Investigation for Active Tuberculosis Among Child Contacts in Uganda Published online 2013 Sep 27.
20. Khan MA, Walley JD, Witter SN, SK, Javeed S. Tuberculosis patients adherence to direct observation: result of a social study in Pakistan. Health Policy Plan.2005 nOv;20(6):354-65.