

CHILDHOOD TUBERCULOSIS SERVICES IN BUNDA MEDICAL CENTRE PRIVATE SECONDARY LEVEL HOSPITAL

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ABSTRACT

Childhood TB caused more than 10% of pediatric hospital admissions and death. Bunda Medical Citra hospital as private secondary hospital level involved in management of childhood TB in Padang city and covered by National Health Insurance. To describe archives of childhood TB patients in BMC Hospital through National Health Insurance era. Methods This retrospective descriptive study was carried out the data of all childhood TB patients since August 2017 until December 2019. The samples were TB 03 forms. Data were analyzed by Statistical Package for the Social Science (SPSS) 23 software. We collected 152 data from medical record, 86 of them were males (56.6%). The highest number of age group was 0-1 years old (26.9%). Patients were common asymptomatic (31.3%) or had chronic cough as symptom (20.4%). There were 107 subjects (70.4%) that had unclear close contact. Positive tuberculin skin test has found in 65.1%. The most finding of chest X-ray was calcification, hilar thickness, and infiltrate. None cases through gen Xpert examination for sputum. Majority of patients were diagnosed as lung tuberculosis. There were 42 subjects (27.6%) who recovered for six months and 76 subjects (50%) required nine months for therapy. There were 24 subjects (15.8%) who categorized as loss contact patients. Our study showed that childhood TB in BMC private hospital were lung tuberculosis without complication, but most of them has been diagnosed through clinical symptoms, TST, and chest X-ray, no bacteriological confirmation.

Keywords: chest X-ray, childhood tuberculosis, tuberculin skin test, tuberculosis contact

ABSTRAK

Tuberkulosis (TB) pada anak berkontribusi sebesar 10% terhadap angka rawat inap pasien anak dan kematian anak di rumah sakit. RS Bunda Medical Citra sebagai layanan kesehatan tingkat lanjut ikut terlibat dalam penanganan TB anak di kota Padang yang dijamin oleh Jaminan Kesehatan Nasional. Tujuan dari penelitian ini adalah mendeskripsikan profil pasien TB anak di RS BMC pada era Jaminan Kesehatan Nasional. Metode Penelitian dilakukan dengan metode deskriptif retrospektif dengan menggunakan data seluruh pasien TB anak sejak Agustus 2017 sampai dengan Desember 2019. Sampel penelitian adalah semua data pada formulir TB 03. Data dianalisis menggunakan SPSS 23. Kami mengumpulkan 152 data dari rekam medis pasien TB anak, 86 diantaranya adalah laki-laki (56,6%). Jumlah kelompok umur tertinggi adalah kelompok umur 0-1 tahun (26,9%). Pasien umumnya

asimtomatik (31,3%) namun ada juga yang memiliki gejala seperti batuk kronis (20,4%). Terdapat 107 subjek (70,4%) dengan riwayat kontak tidak jelas. Uji tuberculin positif ditemukan pada sebagian besar pasien (65,1%). Hasil rontgen dada yang paling banyak ditemukan adalah kalsifikasi, penebalan hilus, dan infiltrat. Berdasarkan data yang dimiliki, tidak terdapat kasus yang ditemukan dari pemeriksaan gen Xpert sputum. Mayoritas pasien didiagnosis sebagai tuberculosis paru. Sebanyak 42 pasien (27,6%) dinyatakan sembuh setelah menjalani pengobatan selama enam bulan dan 76 subjek (50%) memerlukan waktu pengobatan selama Sembilan bulan. Sebanyak 24 pasien (15,8%) dikategorikan sebagai pasien putus berobat. Penelitian menunjuk kanbahwa TB pada anak di RS BMC Padang merupakan TB paru tanpa komplikasi yang sebagian besar terdiagnosis melalui gejala klinis, TST, dan rontgen thorax, namun belum terkonfirmasi secara bakteriologis.

Kata kunci: rontgen thorax, tuberculosis anak, uji tuberkulin, kontak tuberculosis

BACKGROUND

Tuberculosis (TB) is an airborne disease caused by infection with *Mycobacterium tuberculosis*.^{1,2} Tuberculosis disease in children under 15 years old is known as childhood tuberculosis.^{3,4} Childhood TB caused more than 10% of pediatric hospital admissions and death.^{5,6} When diagnosed and appropriately treated, TB mortality in children approaches zero. World Health Organization (WHO) estimated yearly burden of 1 million new pediatric cases worldwide in 2018 and most of these remaining undiagnosed.^{7,8} Confirming the diagnosis of childhood TB with a laboratory test can be challenging. It is caused by difficult to collect sputum specimens and less likely to have a positive due to smaller number of bacteria. Childhood TB is often made without laboratory confirmation and instead based on clinical signs and symptoms, positive tuberculin skin test (TST) or positive TB blood test/interferon gamma release assays (IGRA), chest X – ray and history contact with a person with infectious TB.⁴

Bunda Medical Citra (BMC) hospital as private secondary hospital level involved in management of childhood TB in Padang city and covered by National Health Insurance. The aim was to describe archives

of childhood TB patients in BMC Hospital through National Health Insurance era.

METHODS

This retrospective descriptive study was carried out the data of all childhood TB patients since August 2017 until December 2019. The samples were TB 03 forms. Data were analyzed by Statistical Package for the Social Science (SPSS) 23 software.

RESULTS

There were 152 subjects from childhood TB 03 forms of BMC Hospital since August 2017 until December 2019. Table 1 (n = 152) shows, subjects were predominantly male (56.6%) and age group of 0 – 1 years old (26.9%). The youngest subject TB confirmed was 7 months old and the oldest was 15 years old.

Table 1. Distribution of subject characteristics

Subjects Characteristics	n = 152 (%)
Gender	
Male	86 (56.6)
Female	66 (43.4)
Age	
0-1 years old	41 (26.9)
1-3 years old	30 (1.7)
3-5 years old	28 (18.4)

Subjects Characteristics	n = 152 (%)
5-10 years old	36 (23.7)
10-15 years old	16 (10.5)
≥ 15 years old	1 (0.8)

Table 2 shows the distribution of subjective and objective findings. Based on the table, majority of subjects were asymptomatic (31.3%). In symptomatic subjects, the most common early sign and symptom was cough (20.4%). Most of subjects were unclear history of contact (74.3%) Most of subjects had positive tuberculin skin test (65.1%); the highest group was having induration at 10 – 14 cm (27.6 %). We found chest X-ray abnormalities in almost patients. Calcification, hilar thickness and infiltrate (82.3%) were majority of chest X – ray findings. We found that tuberculosis suspected (79.6%) was the most common expertise.

Table 2. Distribution of subjects clinical signs/ symptoms and history of contact

Characteristics	n = 152 (%)
Subjective findings	
Clinical signs and symptoms	
Fever > 14 days	5 (3.3)
Fever and cough > 14 days	13 (8.6)
Fever > 14 days and lymph node enlargement	1 (0.7)
Fever > 14 days, lymph node and bone enlargement	1 (0.7)
Fever > 14 days, lymph node enlargement, weight loss	1 (0.7)
Cough > 14 days	31 (20.4)
Cough > 14 days and lymph node enlargement	8 (5.3)
Cough > 14 days and weight loss	5 (3.3)
Cough > 14 days, lymph node enlargement, and weight loss	1 (0.7)
Lymph node enlargement	28 (18.4)
Lymph node enlargement and	1 (0.7)

Characteristics	n = 152 (%)
weight loss	
Weight loss	9 (5.9)
Asymptomatic	48 (31.3)
History of contact	
Unclear history of contact	113(74.3)
TB suspected close contact	6 (3.9)
TB bacteriological confirmed close contact	22 (14.5)
TB suspected casual contact	1 (0.7)
TB bacteriological confirmed casual contact	10 (6.6)
Objective findings Tuberculin skin test	
Negative	7 (4.6)
Positive	85 (65.1)
10-14 cm	42 (27.6)
15-19 cm	21 (13.8)
20-24 cm	8 (5.3)
≥25 cm	2 (1.3)
Unclear measurement	12 (17.1)
Not recorded	60 (39.5)
Chest X-ray Findings	
No calcification, hilar thickness, and infiltrate	19 (12.5)
Infiltrate	4 (2.6)
Hilar thickness and infiltrate	4 (2.6)
Calcification, hilar thickness and infiltrate	125(82.3)
Expertise	
Normal	15 (9.9)
Bronchopneumonia	2 (1.3)
Tuberculosis suspected	121(79.6)
Tuberculosis suspected and thymus enlargement	1 (0.7)
Bilateral pulmonary tuberculosis	13 (8.5)

Table 3 shows distribution of subject's tuberculosis type and duration of therapy. Based on the table, we found the most common tuberculosis type as pulmonary tuberculosis of 108 subjects

(71.1%), pulmonary with extrapulmonary tuberculosis of 37 subjects (24.3%), extrapulmonary tuberculosis (lymphadenitis) of 7 subjects (4.6%) consecutively. Most of them (50%) required 9 months for therapy. Unfortunately, we lost contact for 24 subjects (15.8%).

Table 3. Distribution of subject's tuberculosis type and duration of therapy

Characteristics	n = 152 (%)
Tuberculosis type	
Pulmonary TB	108 (71,1)
Extrapulmonary TB (lymphadenitis)	7 (4,6) 37 (24,3)
Pulmonary +extrapulmonary TB (lymphadenitis)	
Duration of therapy	
6 months	42 (27,6)
9 months	76 (50)
In treatments	10 (6,6)
Loss contact	24 (15,8)

DISCUSSION

There were 152 subjects. Table 1 (n = 152) shows, subjects were predominantly male (56.6%). Several studies on childhood TB like ours report slightly more males than females with TB. Sally – Ann Ohenedkk studied 215 childhood TB in Ghana. They found that 52.6% were male.^{6,9,10} In sync to research conducted at RSUP M. Djamil Padang in 2014-2016, numbers of males (66.7%) were higher than numbers of females (33.3%); with a ratio of 2: 1. The highest number of age group was 0 – 1 years old (26.9%). The youngest subject TB confirmed was 7 months old and the oldest was 15 years old. Younger children are reported having a higher risk of progression from TB infection to disease. It is caused by not fully developed of children's cellular

immunity in less than 5 years old. The risk of infection will be decrease along with increased age.^{6,9,11,12}

Table 2 shows the distribution of subjective and objective findings. Based on the table, majority of subjects were asymptomatic (31.3%). Childhood TB is often non – specific symptoms, so we need to know their history of contact and supporting examination.¹³⁻¹⁵ The clinical signs/ symptoms are less specific in children compared to adults and are often confused with bacterial pneumonia. It challenges in confirming the diagnosis.^{15,16} The most common early sign/ symptom was cough (20.4%) more than 2 weeks that followed to another symptom such as weight loss/ failure to thrive, chronic fever, fatigue, less active children.¹⁵⁻¹⁷ Most of subjects were unclear history of contact (74.3%). Most of TB cases are affected by previous adult positive bacteriological confirmed mainly. Adult positive bacteriological confirmed with extensive pulmonary infiltrate or cavity in upper lobe, productive cough and sputum has higher risk of transmission. We require to looking for history of contact in unclear subjects comprehensively.^{14,17} Most of subjects had positive tuberculin skin test (65.1%); the highest group was having induration at 10 – 14 cm (27.6 %). Tuberculin skin test has a high sensitivity and specificity (more than 90%) to confirmed the diagnosis tuberculosis especially in children. Tuberculin skin test can be negative in anergy conditions (having immune suppression). It reduces body's reaction to tuberculin although it has been infected by TB. It occurs in immunocompromised subjects such as HIV (human immunodeficiency virus) /AIDS (acquired immunodeficiency syndrome), long-term steroid use, malignancy, malnutrition and severe TB.^{18,19} We found chest X-ray abnormalities in almost patients. Calcification, hilar thickness and infiltrate

(82.3%) were majority of chest X – ray findings. We found tuberculosis suspected (79.6%) as the most common expertise. Children’s chest X-ray findings are not specific for the diagnosis of TB although its findings can help to confirmed TB, such as finding infiltrates and enlarged hilar lymph nodes. We can found in pneumonia and other respiratory infections also.^{12,14}

Table 3 shows that tuberculosis types are pulmonary and extrapulmonary tuberculosis. The numbers of pulmonary tuberculosis are higher than extrapulmonary tuberculosis. There are many various of extrapulmonary tuberculosis.⁸This study found that pulmonary tuberculosis of 108 subjects (71.1%) and extrapulmonary tuberculosis (lymphadenitis) of 7 subjects (4.6%). We found that 76 subjects (50%) required 9 months and 42 subjects (27.6%) required 6 months for therapy. There were 10 subjects (6.6%) in treatment and we lost contact for 24 subjects (15.8%).We need 6 months for treatment aiming to decrease the residual population of *Mycobacterium tuberculosis* and to prevent of relapse event. Treatment for more than 6 months of uncomplicated pulmonary TB indicates relapse happened.¹⁴Satisfactory response is a condition when clinical symptoms improve such as appetite getting better and weight gain. If the responses are worse, we need to consider resistance, complications, or other lung disease happened.²⁰

This study helps researchers to know the profile of childhood TB, especially in BMC Hospital. It can help to manage childhood TB comprehensively. This study has some limitations. Firstly, most of subjects were unclear history of contact. Further tracing is needed to find out the patient's contact history Secondly, there were incomplete patient data. Thirdly, there were loss contact subjects. Fourthly, this study did not include the socioeconomic status of the patient's family, as well as the

patient's nutritional status which having important role to childhood TB risk factors. We did not perform rapid molecular diagnostic or IGRA. This study can be used for further study.

CONCLUSIONS

Childhood TB caused more than 10% of pediatric hospital admissions and death. Diagnosis of TB is difficult in children, particularly in developing countries. Children have non – specific clinical signs/ symptoms, variable chest X – ray findings/ expertise. It has relied mainly on clinical case definitions, tuberculin skin - testing and chest X – ray. The study showed that most of childhood TB in BMC private hospital were male and 0 – 1 years old. Majority of subjects were lung tuberculosis without complication, but most of them has been diagnosed through clinical symptoms, TST, and chest X-ray, no bacteriological confirmation. Almost subjects had unclear history of contact.

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