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The Body Weights' Follow Up Before and After 6 Months Therapy of Oral Anti-Tuberculosis Therapy in Children in Medan, Sumatra Utara

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Abstract

BACKGROUND: Tuberculosis remains an important issue of children health, particularly in developing countries. Body Weight is one of the tuberculosis symptoms and used to identified children tuberculosis scoring in Indonesia.

AIM: The study aims to get an overview of body weight and body weight increment during oral anti-tuberculosis in Medan, Sumatra Utara.

METHODS: Medical records of children with tuberculosis in the Haji Hospital of Sumatra Utara located in Medan during January 2018 till July 2018 were compiled for the children characteristic, body weight before and after oral anti-tuberculosis treatment.

RESULTS: There were 99 children medical records included in the study, 42.4% children 1 to 5 years old treated as tuberculosis. At the early treatment, many children were in severe malnutrition (85%). However, after 6 months of tuberculosis treatment, there were many children (78%) got their body weight increment.

CONCLUSION: Body weight is an important sign and symptom of children with tuberculosis.

Introduction

Tuberculosis remains the global challenge in the health sector, particularly for children. Indonesia is the second-largest country (after India) which get burdens of Tuberculosis in the world. In Indonesia from 2013 to 2017, children under 14 years old who got tuberculosis were ranging from 8 to 10,1 percent [1]. Body Weight (BW) is one of the tuberculosis symptoms and one of the indicators as Tuberculosis scoring used to identified children tuberculosis. Tuberculosis scoring is widely applied by paediatricians since its inception in 2008, particularly in resource-limited facilities [2].

The study aims to get an overview of body weight and body weight increment during oral anti-tuberculosis in Medan, Sumatra Utara.

Material and Methods

This is a hospital-based retrospective study where medical records of children (< 18 years old) diagnosed and treated as tuberculosis during January 2018 till July 2018 were chosen and compiled. The Haji Hospital of Sumatra Utara was purposely selected as this is the type B hospital owned by the provincial government and serve as one of referring hospitals for the district and another municipalities hospital in Sumatra Utara. Medical records show tuberculosis and HIV, cancer, organ transplantation, diabetes or chronic diseases (heart and kidney) were excluded. The body weight in each medical record was noted at the beginning of the tuberculosis treatment and the end of 6 months of therapy. The applicable curve (WHO or CDC) was applied to bodyweight per age accordingly.

Results

During the study period, there were 128 children treated as tuberculosis; there are 99 medical records included in the study sample. There are 42.4% children age 1-5 years old treated as tuberculosis and 33.3% age 6 – 10 years old (Table 1).

Table 1: Characteristic of respondent

Age	N	%
< 1 year old	2	2
1-5 years old	42	42.4
6-10 years old	33	33.3
11-15 years old	17	17.2
16-17 years old	5	5.1
Total	99	100

Mainly the children treated as tuberculosis are male (53.5%) Table 2.

Table 2: Sex distribution

Sex	N	%
Male	53	53.5
Female	46	46.5
Total	99	100

At the early of treatment started, many respondents suffer to malnutrition. There are 84 children had severe malnutrition (85%) and 3 children (3%) had mild malnutrition (Table 3).

Table 3: Bodyweight per age of children at the early stage of OAT treatment

BW / Age	N	%
Normal	12	12.1
Mild	3	3
Severe	84	84.8
Total	99	100

At the end of OAT therapy, there were 77 children (78%) showed BW increment, 16 children (16%) keep normal and there were 6 children (6%) had lower BW than before (Table 4).

Table 4: BW comparison before and after OAT therapy

BW comparison	N	%
Similar	16	16.2
Increment	77	77.8
Lower	6	6.1
Total	99	100

Discussion

This study found that the age of children who got tuberculosis was from 1 to 5 years old and dominated by male. Children can present with TB disease at any age but most commonly, in TB-endemic countries, between 1-4 years. Pulmonary TB is the commonest type of TB in children [3]. In most countries, the adult male seems to be more susceptible to tuberculosis (TB) than adult female [4]. This study shows that boys are more frequent to have tuberculosis than girls but this result is too early to conclude. Sex difference of tuberculosis is so far contributed after puberty [4]. Malnutrition and tuberculosis are the two problems that interact with each other, particularly in the underdeveloped regions of the world [5]. Tuberculosis mortality rates are equal to their economic level. Similarly, nutritional status is significantly lower in patients with active tuberculosis compared to healthy controls [5].

For any infection, including tuberculosis infection, there is a complex interaction between the host response and the virulence of the organisms, which modulates the overall metabolic response and the degree and the pattern of tissue loss. Children with tuberculosis, a reduction in appetite, nutrient malabsorption, micronutrient malabsorption and altered metabolism leads to wasting [5]. Anorexia is also a contributing factor for wasting in tuberculosis [5]. This study found that more than 85% of respondents' body weight (BW) per age were under normal. This is mainly due to the children intake of food was insecure as part of the household food insecurity. A case-control study from India concluded that household food insecurity is part of the risk factors associated with tuberculosis [6].

However, how the child nutritional status is mainly back to normal after the tuberculosis treatment course is poorly understood. This study found that more than 75% of respondents got their body weight increment at the end of tuberculosis therapy, although there were 6% of respondents got lower body weight. It is assumed that the increment is due to the tuberculosis therapy which causes a rapid drop in bacillary load and improves nutritional status [7]. Unfortunately, this study was unable to find an in-depth assessment of food intake before and during tuberculosis treatment.

Leptin is thought to be a mediator in the complex process between TB, nutrition status and host immune response. Leptin level increment in the body is correlated to increment energy, protein and fat intake which is increased after administration of oral anti-tuberculosis therapy either in intensive phase or maintenance phase [8]. Thus, the more energy intake will increase body weight during and after tuberculosis therapy.

In conclusion, this study confirmed that the body weight and body increment is still an important sign and symptom of tuberculosis before and after treatment. However, how the bodyweight plays the role of tuberculosis infection and its connection vice versa, is poorly understood.

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