Case Series

Please cite this paper as: Dian Ayu Juwita*, Helmi Arifin*, Finny Fitri Yani**, Deswinar Darwin*. A Prospective Descriptive Study on the Drug Classification and Medication History from Tuberculosis Children Outpatients in Dr. M. Djamil Hospital, Padang-Indonesia. IJPTP, 2013, 4(2), supplement II, 666-669.

Corresponding Author:

Dian Ayu Juwita
Faculty of Pharmacy, University of Andalas,
Kampus Limau Manis, Padang 25163
Tel 0751-71682
Fax 0751-777057
Email: dianayujuwita@yahoo.com

Abstract

To investigate and analyze the drugs classification, phase of therapy, and medication history from children outpatients of tuberculosis. The study was conducted by the method of prospective and analyzed descriptively on a limited population for 4 months. Over 57 patients observed, the percentages of patient in each phase of therapy were 42.1% for intensive phase and 57.9% for extended phase of therapy. The identification of drugs that were used reveals that isoniazid was used in 44.31% of patients; rifampicin in 43.41%, pyrazinamide in 11.07% and ethambutol in 1.19% of patients. Anti-tuberculosis drugs were used in single medication in 0%; two-drug combination in 56.1%; and three-drug combination in 43.8% of patients. The medication history taking showed that 98.25% of the cases were new cases; 0% was relapse case; 1.75% was drug withdrawal case; and 0% was medication failed case. TB treatment in children outpatient in DR. M. Djamil Hospital Padang has in accordance with standard children’s TB therapy is using a combination of anti-tuberculosis drugs are tailored to the patient phase of therapy. Anti-Tuberculosis drugs most commonly used are Isoniazid, rifampicin and pyrazinamide, where everything is a first-line anti-TB drugs.

Keywords: tuberculosis children outpatient, anti-tuberculosis drugs, anti-TB drugs classification, medication history, phase of therapy

Introduction

Acute Tuberculosis (TB) has been the leading cause of death for infectious disease in children and adults [1,2,3]. In Indonesia, tuberculosis is a primary health problem in terms of mortality, morbidity, diagnosis and treatment [3]. Indonesia ranks third among TB high-burden countries after India and China with approximately 539,000 new cases and approximately 101,000 deaths per year [2]. Around 10-15% of all cases occur in children aged < 15 years [3,4].

Increased number of tuberculosis incidence in various places is thought to be triggered by several causes including: improper diagnosis, inadequate treatment, unsuccessful prevention programs, the infection of HIV/AIDS, drug resistance, increased poverty, and inadequate health services [3,5].

Children’s Tuberculosis is a problem that cannot be ignored, because it is a systemic disease that can affect almost any organ, causing malnutrition and disturbance in daily activities. Severe TB can lead to lung and other organ defects. Without proper diagnosis and management, TB is most likely to cause a high mortality rate and the infected children can be the source of future infection [6,7].

The management of TB in children is a unity between the provision of medical intervention, nutritional management and treatment of comorbidities [2]. In contrast to adults, Anti-tuberculosis drugs (Anti-TB Drugs) in children are not given two or three times a week but given every day, so children need to be given extra attention both on the intensive phase and the extended phase because they cannot regulate their own treatment, and improper treatment can cause resistance [3,8]. The treatment should be based on a rational and appropriate therapy to the treatment phase as well as the patient’s medical history in order to achieve optimal clinical objectives. The use of drug can be stated rational if the drug is used as indicated, considers the patient's condition, appropriate drug selection, consider the benefits and risks for the patients [9,10].

The present study was conducted to determine the type and combination of anti-tuberculosis drugs used in the DR. M. Djamil Hospital Padang, the phase of treatment and to take the patient...
medication history. This study is expected to be a reference data to prevent and minimize the problems that occur in children as well as improving the success of TB treatment in children.

Material and Methods
The study was conducted prospectively and analyzed with descriptive method. The study population included all children outpatients diagnosed with TB who were in the treatment at the DR. M. Djamil Hospital Padang from April to July 2010. Data sources were medical records of pediatric patients undergoing TB treatment, medical records and laboratory test results. The collected data were then transferred to the data collection sheet and analyzed descriptively which included phase of therapy, type of drug, drug combinations and medication history.

Results and Findings
Table 1. Observations in pediatric patients with the diagnosis of tuberculosis

<table>
<thead>
<tr>
<th>Observation Characteristics</th>
<th>Quantity</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase of therapy a. Intensive phase therapy</td>
<td>24</td>
<td>42.1</td>
</tr>
<tr>
<td>b. Extended phase therapy</td>
<td>33</td>
<td>57.9</td>
</tr>
<tr>
<td>Type of Anti-TB Drugs A. First-line Drugs a. Isoniazid</td>
<td>148</td>
<td>44.31</td>
</tr>
<tr>
<td>b. Rifampicin</td>
<td>145</td>
<td>43.41</td>
</tr>
<tr>
<td>c. Pyrazinamide</td>
<td>37</td>
<td>11.07</td>
</tr>
<tr>
<td>d. Ethambutol</td>
<td>4</td>
<td>1.19</td>
</tr>
<tr>
<td>B. Second-line Drugs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Drugs combination a. Single medication</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b. Two-drug combination</td>
<td>25</td>
<td>56.1</td>
</tr>
<tr>
<td>c. Three-drug combination</td>
<td>32</td>
<td>43.8</td>
</tr>
<tr>
<td>The medication history a. New cases</td>
<td>56</td>
<td>98.25</td>
</tr>
<tr>
<td>b. Relapse case</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>c. Drug withdrawal case</td>
<td>1</td>
<td>1.75</td>
</tr>
<tr>
<td>d. Medication failed case</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion and Conclusion
From 216 pediatric patients who visited the DR. M. Djamil Hospital Padang during April to July 2010, 57 of them were diagnosed with tuberculosis and receiving anti-TB drug therapy.

The survey results revealed that TB treatment with drug combination had been applied to the treatment of Tuberculosis children outpatient in DR. M. Djamil Hospital Padang, which can be seen from the absence of patients treated with a single anti-TB drug. A total of 56.1% of patients received 2 anti-TB drugs combination, while 43.8% receive 3 drugs combination. Types and combinations of drugs used had also been adjusted based on the patient’s phase therapy. Patients receiving 2 drugs combination therapy were much more because 57.9% of the total TB patients underwent extended phase therapy, whereas 42.1% of patients were in the intensive phase therapy.

TB treatment is divided into two phases: the intensive phase (2 months) and the extended phase (4 Months) (2). The principle of treatment using a combination at least 3 kinds of drugs in the intensive phase, followed by 2 kinds of drugs in the extended phase and given daily for 6-12 months (2,13). Provision of a combination of drugs and in the long term than to kill all the TB germs also to reduce the likelihood of recurrence (3). Intensive phase is useful for destroying populations of acid-fast bacilli (AFB) quickly, while the extended phase to eliminate the rest of the dormant AFB (3).

Types of anti-tuberculosis drugs most commonly used were isoniazid and rifampicin. This is because both of these drugs are important drugs for treating all types of tuberculosis, and are used both in intensive phase and extended phase. Isoniazid and rifampicin are the most effective drugs, relatively non-toxic, easily administered, and the price is not expensive (12,13).

The action of anti-tuberculosis drugs is based on three mechanisms: the killing activity, sterilizing activity, and preventing resistance. Isoniazid is the most potent drug in killing bacteria rather than rifampicin and streptomycin, and is bactericidal and very effective against bacteria in a state of active metabolic (growing bacteria), and is bacteriostatic against dormant germs (5,12). Rifampicin and pyrazinamide are the most potent drugs in sterilizing mechanism. Rifampicin is bactericidal against the bacteria that directly penetrates most tissues and phagocytic cells. Rifampicin can kill organisms that are resistant to many types of drugs, such as intra-cell organisms and which are in the abscess cavity and lungs, while pyrazinamide is active sterilization agent to fight the remnants of organisms in the cell that can lead to relapse (12,14).

The least Anti-TB drug prescribed in the treatment of tuberculosis in Dr. M. Djamil Hospital Padang was ethambutol, with the percentage of 1.19%. This drug is not widely used in the treatment of children tuberculosis because ethambutol is not recommended for general use in children as it can cause neuritis retrobuller which could result in loss of visual acuity and red-green color blindness. But the administration of this drug should be considered in children with severe and drug resistant...
tuberculosis if other drugs are not available or cannot be used.

The entire prescribed drugs were first-line anti-TB drugs and there was no indication for the administration of second-line drugs. The second-line anti-TB drugs include streptomycin (S), Para-amino salicylic acid (PAS), ethionamide, ofloxacin, levofloxacin, ciprofloxacin, kanamycin, etc. First-line drugs are better in efficacy and safety rather than second-line drugs. With these drugs, the tuberculosis patient can be cured. Second-line drugs are considered to use if the resistance arises with the first-line drugs, hence those drugs are replaced with at least 2-3 second-line drugs which are known to remain potential, so the patient received 5 or 6 drugs at once. However, second-line drugs have not been approved for use in children regarding the low efficacy and the risk of toxicity in children.

A total of 56 cases out of 57 cases of TB occurred in Dr. M. Djamil Hospital Padang were new cases. In which the patients have not been treated with anti-TB drugs or have been prescribed the drugs for less than one month (30 days). While one patient was drug withdrawal case (treatment after drop-out/default), in which the treatment of patients who had at least 1 month of treatment and stopped for 2 months or more then come back for treatment. After interviewing the parents, it was known that the patient experienced drug withdrawal since 4 months before, because the parents went out of town so that no one gave anti-TB drugs to the patient. This problem is likely to happen due to less education for families about TB and its management. Patients and parents do not know about the long-term TB treatment, regular, and should not be interrupted, and do not aware of the potential risk of breaking the rule. Therefore it is strongly recommended to educate the patients and parents on the significance of completing the treatment to the end in order to avoid resistance and prevent recurrence. Once the resistance happens, the treatment will be more difficult and require longer time.

This study concludes the following:
1. TB treatment on children outpatients in DR. M. Djamil Hospital Padang was in accordance with standard children’s TB therapy in which the combination of anti-tuberculosis drugs are adjusted based on the phase of the therapy.
2. Anti-Tuberculosis drugs most commonly used were isoniazid, rifampicin and pyrazinamide, that are all included in first-line anti-TB drugs.
3. From the patient’s medication history, it was still found the children TB patient experiencing drug withdrawal.

References
AUTHORS’ CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.