

Accuracy of Antibiotic use in Pediatric ISPA Patients at Hospital X Malang City

Debby Ayu Larasati, Agung Permata, Beta Herlila Sekti

Institut Teknologi Sains dan Kesehatan RS dr. Soepraoen Malang, Indonesia

E-mail: 920383.debbyayu@gmail.com

ABSTRACT

Acute Respiratory Tract Infections (ARI) are one of the most serious health problems in the world. According to UNICEF and WHO, ISPA is one of the leading causes of death in humans compared to the number of deaths from AIDS, malaria and measles. The prevalence period of ISPA, which is calculated within two years, according to the diagnosis by health workers in 2018, is known to reach 1,017,290, of which as many as 182,338 cases occur in children aged 12 years and under. Acute Respiratory Tract Infection (ARI) generally occurs in children and adults and is the main cause of mild morbidity. This study aims to determine the rationale for the use of antibiotics in pediatric patients with upper respiratory tract infections at Hospital X Malang City with parameters that include the right patient, the right indication, the right dose, and the right duration. This type of research is a type of non-experimental research with a descriptive research design and retrospective data collection. The results of the demographic data obtained were more male patients, namely 37 patients (52.8%), the highest age range of 1-5 years (50%), the most common diagnosis, namely pharyngitis (58.6%), and the suitability of the use of antibiotics in pediatric ARIA patients at Hospital X Malang City was in accordance with the guidelines of Pharmaceutical Care for respiratory diseases in 2005. and 100% right dose, and 100% right duration.

Keywords, Antibiotics, ISPA, The Rationality of Antibiotic Use



INTRODUCTION

Acute Respiratory Tract Infection (ARI) is one of the serious health problems in the world and in Indonesia. According to UNICEF and WHO, in 2008, it was reported that ISPA is one of the leading causes of death in humans compared to the number of deaths due to AIDS, malaria and measles (Wijaya, 2015). Deaths caused by ISPA occur in less developed and developed countries such as Sub-Saharan Africa and in Asia, especially Southeast Asia and South Asia (Cahyani, 2019). There are more than 1 million cases that occur in Sub-Saharan Africa alone per year; in South Asia, there are more than 700 thousand cases per year, and Indonesia ranks sixth in child deaths due to ISPA in the world (Chandra. Zuhripal Hadi, 2020).

The prevalence period of ISPA, which is calculated within two years, according to the diagnosis by health workers in 2018, is known to reach 1,017,290, of which as many as 182,338 cases occur in children aged 12 years and under (Fabanyo, 2022). There are five provinces in Indonesia with the highest ISPA, namely Papua (10%), Bengkulu (8%), East Nusa Tenggara (7.5%), Central Kalimantan (5.5%), and East Java (5.3%). Riskesdas (2018), one of the treatments for ISPA disease is by administering antibiotics. Examples of antibiotics given include macrolides, penicillins and cephalosporins. Antibiotics given to patients with ISPA require several considerations, namely diagnosis, physical examination, clinical symptoms, supporting examinations, and if the ISPA suffered is caused by bacteria (Kemenkes RI, 2018).

Acute Respiratory Tract Infection (ARI) generally occurs in children and adults and is the main cause of mild morbidity (Hayati, 2014). ISPA is usually caused by several viruses, such as rhinovirus, coronavirus, parainfluenza, respiratory virus (RSV), adenovirus, human metapneumovirus, influenza, enterovirus and the newly discovered bocavirus (Cotton et al., 2008). *Period prevalence* ISPA was calculated within a period of 2 years according to the diagnosis by health workers. In 2018, ISPA cases were known to reach 1,017,290, of which as many as 182,338 cases occurred in children aged 12 years and under. There are five provinces in Indonesia with the highest ISPA, namely Papua (10%), Bengkulu (8%), East Nusa Tenggara (7.5%), Central Kalimantan (5.5%), and East Java (5.3%) (Kemenkes RI, 2018).

In a previous study at the Pekanbaru Health Center in 2014, it was found that the indication was 33.7% inaccuracy, which indirectly caused inaccuracy in the dosage, the right patient, the right drug, and the right duration. While the corresponding is 66.3%. In this study, it was found that the main cause of the inappropriate use of antibiotics in ISPA patients was the administration of therapy without indications. Namely, antibiotics were given to patients without clear indications (Muharni et al., 2014).

The purpose of this study is to find out whether or not antibiotics are given to pediatric URI patients at Hospital X Malang City. The accuracy seen includes the right dose, the right patient, the right indication, and the right duration compared to the guidelines for giving antibiotics to ISPA patients.

RESEARCH METHODS

This type of non-experimental research was conducted using a retrospective approach from the medical records of patients diagnosed with upper ISPA. The collection and recording of patient information is carried out through the search of medical records of pediatric patients who have been diagnosed with Upper Acute Respiratory Tract Infection (ARI) by referring to the inclusion and exclusion criteria that have been set. The data collected includes information about gender, age of patients, disease diagnosis, type of antibiotics used, antibiotic dose, and duration of antibiotic administration. Furthermore, an analysis of the rationality of antibiotic use was carried out, which included an evaluation of the appropriateness of antibiotic use in patients, the accuracy of indications, the accuracy of the dose, and the accuracy of the duration of antibiotic administration. The results of the analysis were then compared with the guidelines used as a reference, namely *Pharmaceutical Care* for Respiratory Diseases from the Ministry of Health of the Republic of Indonesia in 2005, to see the accuracy of the drug.

RESULTS AND DISCUSSION

In this study, demographic data was obtained as shown in Table 1, which stated that pediatric patients with upper ISPA diagnosis amounted to 70 patients. There were more patients with the male gender, with 37 (52.8%) patients, compared to female patients, which were 33 (47.2%). Boys are more active and love outdoor activities in an Area whose environment is dirty and dusty, up to making body Contact directly with airborne particles and Disease agents (Dewi, Dewi, et al., 2020). According to the Ministry of Health of the Republic of Indonesia, in 2009, the age category was divided into several categories, namely, the period of toddlers 1-5 years old and children 6-12 years old (Adistie et al., 2018). Based on the results of the research from the total number of samples, three patients (4.3%) were obtained from patients under the age of 1 year, 32 patients (45.7%) in the age range of 6-12 years, and the most in the age range of 1-5 years with a percentage of 50% with a total of 35 patients. In the age range of toddlers and children, the developmental stage begins; children begin to interact and enter the wider society (e.g., kindergarten). Children begin to learn objectively about the world of learning and begin to be interested in activities in the outside world, so it is possible for children

to be exposed to dust and pollution while playing and coming into contact with people with ARI (Dewi, Dewi, et al., 2020).

Table 1. Demographic Data of Pediatric URI Patients at Hospital X Malang

Characteristic	n	%
Gender		
- Man	37	52,8%
- Woman	33	47,2%
Total	70	100%
Age		
- < 1 year	3	4,3%
- 1-5 years	35	50%
- 6-12 years	32	45,7%
Total	70	100%

The results of this study showed that the diagnosis of upper ISPA in children at hospital X Malang City from 70 samples, as many as 17 patients (24.3%) were diagnosed with tonsillitis, 12 patients (17.1%) were diagnosed with sinusitis, and the most common diagnosis was pharyngitis in 41 patients (58.6%).

Table 2. Diagnosis of ISPA

Diagnosis	Frequency (f)	Percentage (%)
Pharyngitis	41	58,6%
Sinusitis	12	17,1%
Tonsillitis	17	24,3%
Total	70	100%

Table 3. Distribution Based on Antibiotic Use Percentage

Antibiotic Name	Frequency (f)	Percentage (%)
Amoxicillin	30	42%
Erythromycin	18	25,7%
Azitromisism	3	4,3%
Cefadroxil	7	10%
Co-amoxiclav	12	17,1%
Total	70	100%

The antibiotic prescribing pattern in this study only uses a single antibiotic. The most widely used type of antibiotic is amoxicillin, which is 30 cases with a percentage of 42%. In the administration of erythromycin antibiotics in as many as 18 patients (25.7%), azithromycin in as many as three patients (4.3%), cephalixin in as many as seven patients (10%), and Coamoxyclav as many as 12 patients (17.1%). The antibiotics that are widely prescribed in this study are the penicillin group, namely amoxicillin, which is a broad-spectrum antibiotic, so it is a relatively safe and suitable antibiotic choice for the treatment of Respiratory Tract Infections. The use of the most widely used penicillin antibiotic is a broad spectrum, so it is a relatively safe and suitable antibiotic choice for the treatment of Respiratory Tract Infections. Related to the intended use is an empirical therapy for infectious diseases whose causes are not yet known, so antibiotics that have a broad spectrum, such as amoxicillin, are used. This antibiotic is a first-line antibiotic for patients with Respiratory Tract Infections, one of which is pharyngitis (Anisa et al., 2022).

Table 4. Evaluation of Accuracy (Duration, Drug, Dose and Patient) of Antibiotic Use in Pediatric ISPA Patients at Hospital X Malang City

Rational Criteria	Frequency (f)		Percentage (%)	
	Appropriate	Not Suitable	Appropriate	Not Suitable
Right Medication	70	0	100%	-
Right Dosage	70	0	100%	-
Right Duration	70	0	100%	-
Right Patient	70	0	100%	-
Total	70	100%	100%	-

In this study, the results of the rational evaluation of the use of antibiotics given to pediatric ISPA patients at Hospital X Malang City were obtained. Data on the use of antibiotics for the right drug was obtained as much as 100%, the right dose 100%, the right duration 100%, and the right patient 100% of the 70 patients who were given antibiotics in the treatment of upper ISPA.

Data was obtained from the medical records of pediatric patients with an upper ISPA diagnosis with antibiotic treatment, and it was found that for the administration of antibiotics to patients, the right drug was 100% of the 70 patients. It is said that the drug is appropriate if the drug chosen can provide a therapeutic effect on the patient according to the spectrum of the disease. Examining the rationality of the right drug variables is done by comparing the selection of the type of antibiotic with several kinds of literature. The standard therapy used is *Pharmaceutical Care* for Respiratory Diseases from the Ministry of Health of the Republic of Indonesia in 2005 and *Pharmacotherapy Handbook Edition 9*.

Based on the results of the research conducted, it was found that 100% of the 70 patients were on the right dose. The administration of this dose is in accordance with the standard of therapy in *Pharmaceutical Care For Respiratory Diseases* from the Ministry of Health of the Republic of Indonesia in 2005 and *Pharmacotherapy Handbook 9th*, taking into account the patient's age, weight and height. The accuracy of the dosage greatly affects the outcome of the patient's treatment. If there is an error in adjusting the drug dosage in children with ISPA, it can cause ineffective treatment, toxicity, and side effects (Runtu et al., 2020).

The duration of this study was obtained, and 70 patients (100%) received the appropriate duration of antibiotic treatment. This exact duration is seen from the patient's medical record data and then compared with lithography. The duration of antibiotic administration plays a very important role in the continuity of treatment (Kusumawati, 2022). If the administration of antibiotics does not work according to the duration of administration, it will cause tolerance in microorganisms that have not been completed so that bacterial resistance will occur (Dewi, Sutrisno, et al., 2020).

Based on the results of research from medical record data, patients who received antibiotic therapy in pediatric URI patients were found to have 100% correct results where the antibiotics were appropriately given to pediatric URI patients who were detected with infections that were seen by the signs, symptoms, and diagnosis of the doctor. The right patient is also seen from the administration of antibiotics based on the patient's pathophysiological or physiological condition, and there are no contraindications for the patient. The patient's exact criteria are seen from the presence or absence of hypersensitivity (allergic) reactions to

antibiotics and a previous history of illness experienced by patients who have contraindications to antibiotics (Dewi, Dewi, et al., 2020).

CONCLUSION

Based on the results of the study on the rationale of antibiotic use in 70 pediatric URI patients at Hospital X Malang City, it can be concluded that the results of the rational evaluation of antibiotic use based on the Right Patient (100%), Right Duration (100%), Right Drug (100%), and Right Dose (100%). The results of the study also showed that 37 patients (52.8%) of child ISPA patients were male and 33 patients (47.2%). Based on the age of patients under one year, there were three patients (4.3%), 35 patients (50%) children aged 1-5 years, followed by 32 patients (45.7%) aged 6-12 years. The most commonly used types of antibiotics in pediatric ISPA patients at Hospital X Malang City are Amoxicillin 30 (42%) and erythromycin 18 (25.7%).

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