
ANALYSIS OF ANTIBIOTIC USE IN PEDIATRIC ACUTE RESPIRATORY TRACT INFECTION (ARTI) PATIENTS AT DASAN TAPEN PUBLIC HEALTH CENTER USING THE ATC/DDD METHOD

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ABSTRACT

Acute Respiratory Tract Infection (ARTI) is one of the leading causes of morbidity and mortality in children. In Indonesia, ARTI remains prevalent and is often treated with antibiotics, though irrational use raises concerns about antimicrobial resistance. This study aimed to evaluate the profile and quantity of antibiotic use in pediatric ARTI patients at Dasan Tapen Public Health Center using the Anatomical Therapeutic Chemical/Defined Daily Dose (ATC/DDD) method. A retrospective cross-sectional design was employed with medical records from January to December 2024. A total of 121 pediatric patients aged 1–12 years met the inclusion criteria. Results indicated that amoxicillin (79.3%) was the most prescribed antibiotic, followed by cefadroxil (19.0%) and cefixime (1.7%). The total DDD/1000 patient-days (KPRJ) was 214.64, with amoxicillin accounting for 186.45, cefadroxil 25.89, and cefixime 2.23. The findings highlight a high utilization rate of antibiotics, particularly amoxicillin, necessitating continuous monitoring to ensure rational prescribing and to prevent resistance.

Keywords: Arti, Antibiotic, ATC/DDD, Pediatric, Dasan Tapen

1. Introduction

Acute Respiratory Tract Infections (ARTI) are among the most common illnesses in children and remain a primary cause of morbidity and mortality worldwide [1]. In Indonesia, ARTI ranks as one of the leading reasons for pediatric visits to healthcare facilities, especially at the primary care level [2]. Despite its mostly viral etiology, antibiotics are frequently prescribed, raising the risk of resistance when used inappropriately [3].

Antibiotics play a crucial role in managing bacterial ARTI, yet irrational prescribing practices are prevalent in both hospitals and primary health centers. Studies have indicated that overuse and misuse of antibiotics contribute significantly to antimicrobial resistance, a pressing global health challenge [4].

The World Health Organization (WHO) has therefore recommended the use of the ATC/DDD methodology for evaluating drug

utilization [5]. The ATC/DDD system provides a standardized metric to quantify drug consumption across populations and settings [6]. By calculating the Defined Daily Dose (DDD) per 1000 patient-days (KPRJ), healthcare providers can assess trends and identify potential irrational use [7]. Several studies in Indonesia have demonstrated varied patterns of antibiotic consumption, emphasizing the need for context-specific evaluation [8].

This study focuses on evaluating antibiotic use among pediatric ARTI patients at Dasan Tapen Public Health Center in 2024. The objective is to determine both the prescribing profile and the quantitative measure of antibiotic use through ATC/DDD analysis, thus providing evidence for more rational and effective antibiotic stewardship at the primary healthcare level.

2. RESEARCH METHODS

This research applied a retrospective cross-sectional design. Data were collected from medical records of pediatric outpatients aged 1–12 years diagnosed with ARTI at Dasan Tapen Public Health Center from January to December 2024.

2.1 Populasi and Sampel

The total population consisted of all pediatric ARTI patients treated during the study period. Using inclusion criteria (complete medical records, diagnosis of ARTI, and prescribed antibiotics), 121 samples were obtained.

2.2 Instruments

Data extraction sheets were employed to collect demographic information, types of antibiotics, dosages, and treatment duration.

2.3 Data Collection

Information was gathered retrospectively from patient medical records.

2.4 Data Analysis

Antibiotic consumption was evaluated using the WHO-recommended ATC/DDD method. Values were expressed as DDD/1000 patient-days (KPRJ) for comparability across studies.

3. RESULTS AND DISCUSSION

3.1 Patient Characteristics

Of the 121 pediatric ARTI patients, 52% were male and 48% female. The majority were aged 5–9 years (82.6%).

3.2 Antibiotic Profile

Three antibiotics were prescribed:

- Amoxicillin (79.3%)
- Cefadroxil (19.0%)
- Cefixime (1.7%)

3.3 Quantitative Use (ATC/DDD)

Table 1. Source: Processed data, 2024

Antibiotic	ATC Code	Route	WHO DDD	DDD/1000 KPRJ	% of Total
Amoxicillin	J01CA04	Oral	1.5	186.45	86.8 %
Cefadroxil	J01DB05	Oral	2.0	25.89	12.1 %
Cefixime	J01DE08	Oral	0.4	2.23	1.1 %
Total	—	—	—	214.64	100 %

The findings revealed that amoxicillin dominated prescribing patterns, consistent with its status as the first-line antibiotic for ARTI due to broad-spectrum coverage and favorable absorption [9]. Cefadroxil served as an alternative when penicillin was not tolerated, while cefixime was used sparingly as a third-line agent.

The total DDD/1000 KPRJ (214.64) was relatively high compared to studies in other Indonesian regions, suggesting intensive antibiotic use [10]. Overreliance on broad-spectrum antibiotics may increase the risk of bacterial resistance, aligning with global concerns regarding antibiotic stewardship [11].

4. CONCLUSION

This study demonstrated that antibiotic use in pediatric ARTI patients at Dasan Tapen Public Health Center in 2024 was dominated by amoxicillin (79.3%), followed by cefadroxil and cefixime. The total DDD/1000 KPRJ reached 214.64, indicating a high level of antibiotic utilization.

These findings emphasize the need for rational prescribing practices and regular evaluations using the ATC/DDD method to mitigate the risk of antibiotic resistance.

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