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CASE REPORT **Open Access**

Case Study: Drug Therapy Monitoring in a Patient with Abdominal Colic at a Regional Public Hospital in Gorontalo

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ABSTRACT

Abdominal colic is a common complaint of abdominal pain frequently observed in hospitalized patients, often associated with gastrointestinal infections. This study aims to evaluate the rationality of antibiotic use and identify potential drug-related problems (DRPs) in patients with abdominal colic. The report was conducted descriptively using a SOAP-based approach, utilizing inpatient medical record data at Gorontalo City General Hospital in February 2025. The case analysis showed that the use of ceftriaxone adhered to the 5R principles (right indication, right patient, right drug, right dose, and right duration). However, the concurrent administration of Fiocilas (ampicillin–cloxacillin) represented an unnecessary duplication of antibiotic therapy that was not supported by clinical indications or culture data. This was categorized as “unnecessary drug therapy” and posed a potential risk for antimicrobial resistance and adverse effects. The recommended pharmaceutical intervention was discontinuation of the additional antibiotic and continuation of the main therapy with clinical monitoring. To conclude, this case emphasizes the important role of pharmacists in monitoring the rational use of antibiotics to improve the safety and effectiveness of patient treatment.

Keywords: Abdominal colic, abdominal pain, drug interactions, drug rationality, pharmacotherapy

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Introduction

Abdominal colic is a type of occasionally abdominal pain, originating from the organs within the abdomen. This condition can be caused by various infections affecting the abdominal organs. Experts explain that abdominal colic is characterized by pain or cramping in the abdomen, often accompanied by nausea and vomiting. Obstruction in the abdominal organs can block the flow of intestinal contents, which then causes pain.[1]

According to data from the World Health Organization (WHO) in 2021, approximately 1.8 to 2 million people worldwide experience abdominal colic each year. The prevalence varies across countries, with rates ranging from 22% in the UK, 31% in China, 14.5% in Japan, 35% in Canada, and 29.5% in France. In Southeast Asia, approximately 583,635 people are affected annually. The prevalence of abdominal colic by age group is 1.3% in those aged 55-64, 1.2% in those aged 65-74, and 1.1% in those aged ≥ 75. By gender, the prevalence is higher in men (68.4%) than in women (31.6%). The prevalence of abdominal colic per 1,000 population varies by country. The number of medications a patient takes can lead to drug-related problems (DRPs).[2]

In Indonesia, abdominal pain remains one of the common causes of hospital admission, particularly related to gastrointestinal disorders. Data from the Ministry of Health of the Republic of Indonesia indicate that digestive system diseases are consistently among the leading causes of inpatient morbidity in regional hospitals. In Gorontalo Province, cases of abdominal pain and gastrointestinal infections are frequently reported in inpatient services, emphasizing the importance of rational drug therapy and antibiotic use in regional referral hospitals.

Drug-related problems are issues that arise during patient therapy that can hinder or potentially hinder the achievement of optimal therapeutic outcomes. These can be caused by various factors. Some types of DRPs include unmet drug needs, use of drugs without proper indications, errors in drug selection, drug interactions, and the use of doses that are too high or too low. Inaccurate drug selection and dosage are part of drug-related issues that can impact patient clinical outcomes. When a drug enters the body, interactions with other substances can affect its pharmacokinetics and pharmacodynamics, resulting in changes in therapeutic effects.[2]

Rational medication use must be carried out correctly and appropriately. If not managed properly, it can delay the achievement of therapeutic targets. Rational medication use occurs when patients take the appropriate dose, at the right time, and for the appropriate duration for their condition. This can speed the healing process and reduce the risk of side effects. Conversely, drug misuse can lead to organ damage, drug resistance, and even death.[3]

The importance of drug therapy monitoring is to ensure safe, effective, and rational drug therapy for patients. This activity includes assessing drug choice, dosage, route of administration, therapeutic response, adverse drug reactions (ADRs), and recommendations for changes or alternatives to therapy. Drug therapy monitoring must be conducted continuously and evaluated regularly at specific intervals to determine the success or failure of therapy.[4]

Based on the literature above, it is clear that abdominal colic can cause various complications and require varying medical treatments. Therefore, the author aims to conduct a retrospective study entitled "Case Study of Drug Therapy Monitoring in Patients with Abdominal Colic at the Regional General Hospital in Gorontalo."

Methods

This study is a descriptive analysis of the medical records of patients with abdominal colic. Patients were patients who underwent inpatient care at a hospital in Gorontalo province during February 2025. The analysis used the SOAP method (Subject, Object, Assessment, and Planning), with reference to the latest clinical literature to assess the suitability of management with medical practice standards.

The inclusion criteria in this study were adult inpatients diagnosed with abdominal colic who received antibiotic therapy and had complete medical record data. The exclusion criteria included patients with incomplete medical records, confirmed non-bacterial causes of abdominal pain, or patients discharged against medical advice.

Case Study

Mrs. X aged 43 years was admitted to a regional public hospital in Gorontalo of Februari 11, 2025 with a chief complaint of recurrent, sudden-onset abdominal pain accompanied by fever. The pain was localized to the left lower quadrant and described as cramping in nature. The patient also reported nausea and vomiting. Her past medical histrory was significant for an ovarian cyst diagnosed in 2021. The physical examination obtained blood pressure of 110/70 mmHg, pulse rate of 105 x/minutes and body temperature of 38.50C. Laboratory examination obtained Hemoglobin value of 8.8 g/dL, Leukocytes 13.000/mcl, Platelet 37.1000/mcl, random blood glucose 15 mg/dL. The pharmacological therapy given was Omeprazole twice daily intravenously, Antrain® three times daily intravenously, Ondansetron three times daily intravenously, Cefriaxone twice daily intravenously, Fiocilas® three times daily intravenously, and extra Paracetamol drips because the patient's body temperature was 38.50C. She also received normal saline eight drips per minutes infusion solution, Sucralfate syrup three times daily, Paracetamol 1 tablet three times daily, Dulcolax® syrup two times daily, Ibuprofen 1 tablet three times daily, Santramol 1 tablet three times daily,

Ferrous Sulfate 1 tablet once daily, Vipalbumin® 2 capsul three times daily, and Mefenamic Acid 1 tablet three times daily. During hospitalization, the patient showed gradual clinical improvement. At discharge, the patient was afebrile, abdominal pain had decreased significantly, leukocyte levels showed improvement, and the patient was discharged in stable condition. The patient's clinical characteristics, laboratory findings, and pharmacotherapy during hospitalization are summarized in Tables 1–4.

Table 1. Clinical data of presented cases.

SOAP components	Data
S (*Subjective*)	- Chief complaint: Abdominal pain that comes and goes suddenly, fever, pain in the lower left quadrant - Other symptoms: conjunctival derms, nausea, vomiting - Medical history: Ovarian cyst since 2021
O (*Objective*)	- Initial vital signs: Blood pressure 110/70 mmHg (normal), Pulse 105x/minute (high), Temperature: 38.5°C (high), Leukocyte: 13,800/µL (elevated) - Platelet: 371,000/mm³ (normal) Limphocyte: 6% (low count) - Random blood glucose: 158 mg/dL (normal) - Erithrocyte: 3,88 million/µL (normal)
A (*Assessment*)	- Diagnosis: Abdominal colic + acute bacterial infection + clinical anemia - DRP Identification: Antibiotic duplication (Ceftriaxone + Fiocilas®) - Rationality of Ceftriaxone use according to the 5T principle - Fiocilas was deemed unnecessary (no therapy failure or culture results)
P (*Planning*)	a. Pharmacology: - Omeprazole IV 2x1 - Ondansetron IV 3x1 - Antrain IV 3x1 - Ceftriaxone IV 2x1 (continue) - Fiocilas IV 3x1 (Stopped) - Paracetamol drip (if the temperature is ≥ 38.5^{0}C) - NaCl 0.9% infusion + Ketorolac - Sucralfate syrup 3x1

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- Paracetamol tablet 3x1
- Dulcolax syrup 2x1
- Santramol 3x1
- Ferro sulfat 1x1
- VIP albumin 3x2
- Mefenamic acid 3x1

b. Non- pharmacology:

- Avoid spicy, sour, fatty foods
- Drink enough fluids 2–2.5 litres/day
- Teach relaxation techniques (deep breathing, meditation)
- High fiber, low fat diet

DRP: Drug-related problem, IV: Intravenous

Table 2. Patient vital signs examination results.

Inspection	Results	Literature	Interpretation
Blood pressure	110/70 mmHg	<120/80 mmHg	Normal
Pulse	105 x/menit	60-100 x/minute	High
Temperature	38.5^0C	36.5ºC -37.5ºC	High
Respiratory rate	20 x/m	12-20 x/minute	Normal

Table 3. Laboratory data of presented case.

Type of Examination	Results	Normal Value	Remarks
Haemoglobin	8.8 g/dL	11.00-16.00 g/dL	Abnormal
Leukocytes	13,800/uL	5,000-10,000/uL	Abnormal
Platelet	$371.000/mm^3$	$150.000-450.000/mm^3$	Normal
Random blood glucose	158 mg/dL	<200 mg/dL	Normal
Erythrocytes	3.88 million/uL	3.5-5.5 million/uL	Normal
Lymphocytes	6%	20-40%	Abnormal

Discussion

Mrs. x aged 43 years, was admitted and hospitalized in class I of Regional General Hospital on February 11, 2025 and was treated for seven days with the chief complaint of frequent abdominal pain that often comes and goes suddenly, fever, conjunctivitis, and pain in the lower left quadrant area. The patient also had a history of ovarian cysts since 2021. The physical examination obtained BP 110/70 mmHg, Pulse 105x per minute and body temperature

38.5^{0}C and further laboratory examinations were immediately carried out. This patient was diagnosed with abdominal colic, acute bacterial infection (main diagnosis) and clinical anemia by the doctor. On the first day of admission the patient was given Omeprazole intravenous, Antrain intravenous, and Ondansetron intravenous.

Table 4. Drug administration of presented case.

No	Drug Name	Dose	Route	Dosage Regimen	Date of admission (February 2025)							
					11	12	13	14	15	16	17	18
1.	Sucralfat syrup	500 mg/5mL	Oral	3x1		✓	✓	✓	✓	✓	✓	✓
2.	Santramol®	500 mg	Oral	3x1					✓	✓	✓	✓
3.	Ferrous Sulfate	200 mg	Oral	1x1						✓	✓	✓
4.	VIP albumin	500 mg	Oral	3x2							✓	✓
5.	Paracetamol	500 mg	Oral	3x1		✓	✓					
6.	Dulcolax syrup	15 ml	Oral	3x1					✓			
7.	Omeprazole		IV	2x1	✓	✓	✓	✓	✓	✓	✓	✓
8.	Ondansentron		IV	3x1	✓	✓	✓	✓	✓	✓	✓	✓
9.	Antrain®		IV	3x1	✓	✓	✓					
10.	Paracetamol drips		IV	If body temperature ≥38,5°C					✓		✓	
11.	Ceftriaxone		IV	2x1		✓	✓	✓	✓			
12.	Fiocilas®	500 mg/6 hours	IV					✓	✓	✓	✓	✓
13.	NaCl 0.9% + Ketorolac 3%	8 tpm	IV								✓	

On February 11, 2025, the patient was given Omeprazole injection 1 ampoule two times daily to protect the gastric mucosa from the risk of irritation due to stress and the use of pain medication. Omeprazole works by inhibiting the H^{+}/K^{+}-ATPase enzyme in gastric parietal cells, which is a proton pump as the final pathway for gastric acid production. This is in line with the dose of omeprazole injection, which is 40 mg 1–2 times/day IV.[5] In addition, the

patient was also given Antrain® 1 ampoule three times daily injection, which functions as an analgesic and antispasmodic to reduce pain due to spasm of the smooth muscles of the gastrointestinal tract, which is a characteristic of abdominal colic. According to MIMS literature the correct dose for the use of Antrain® is 1 ampoule three times a day intramuscular or intravenous.[6] The patient also complained of nausea and vomiting, thus Ondansetron injection 1 ampoule three timed daily was given. Ondansetron is an antiemetic that works by inhibiting the 5-HT3 type serotonin receptor in the central nervous system and digestive tract. According to MIMS literature, the Ondansentron dose is 4–8 mg every 8–12 hours intramuscular or intravenous.[7]

From February 12, 2025, to February 17, 2025, the patient began receiving Ceftriaxone injection, 1 gram twice daily, as the primary antibiotic therapy. Ceftriaxone is a third-generation cephalosporin that works by inhibiting bacterial cell wall synthesis. The usual dose of Ceftriaxone is 1–2 grams per day, divided into 1–2 doses. This antibiotic was chosen because it is able to treat systemic infections indicated by an increase in leukocytes and fever symptoms experienced by the patient.[8] After several days of administration, the patient's leukocyte levels showed a decrease, indicating a positive response to therapy.

In addition to antibiotic therapy, the patient was given 500 mg Paracetamol tablets three times daily to reduce fever. The dosage given is in line with the dosage listed in the literature, namely 500–1000 mg every 4–6 hours, a maximum of 4 grams/day. Paracetamol works by inhibiting the cyclooxygenase enzyme in the central nervous system, thereby reducing the production of prostaglandins that trigger an increase in body temperature.[9] Paracetamol also has a mild analgesic effect that helps relieve discomfort due to fever and abdominal pain. To overcome persistent colic pain, the patient was also given centramol® tablets three times daily. The dosage in this case is in line with the dosage listed in the MIMS, namely 3x1 tablet per day. Centramol contains a combination of analgesic and antispasmodic substances that work by reducing pain impulses and relaxing the smooth muscles of the gastrointestinal tract, making it very suitable for use in patients with complaints of spasmodic abdominal colic.[10] In addition, patients are also given Sucralfate syrup three times daily, which works locally by coating the stomach wall and forming a barrier against stomach acid, thus helping the healing process of gastric mucosa that may be irritated due to illness or medication use. According to Dipiro, the correct dosage for sucralfate is 1 gram (10 mL) four times daily (1 hour before meals and before bedtime).[9]

Patients were also given a daily infusion of 0.9% sodium chloride (NaCl) during treatment as part of fluid therapy. NaCl 0.9% is an isotonic crystalloid solution containing

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sodium and potassium. This solution is used to maintain electrolyte balance and fluid volume, particularly in patients experiencing fever, vomiting, or signs of mild dehydration.[10]

Midway through treatment, the patient was given an injectable antibiotic containing a combination of imipenem 500 mg and cilastatin 500 mg. Imipenem is a carbapenem antibiotic, a broad-spectrum antibiotic that is highly effective against a wide range of Gram-positive and Gram-negative bacteria, including beta-lactamase-producing bacteria. Cilastatin itself is not an antibiotic, but it inhibits the dehydropeptidase-I enzyme in the kidneys that breaks down imipenem. Therefore, cilastatin's presence is crucial for maintaining imipenem levels and effectiveness in the body. The addition of Fiocilas® was presumably intended to broaden antimicrobial coverage in response to suspected severe infection. However, there was no clinical deterioration, no worsening of symptoms, and no laboratory evidence indicating treatment failure with ceftriaxone at the time of antibiotic escalation.

The use of Ceftriaxone was deemed clinically appropriate because the patient exhibited symptoms of systemic infection, namely fever and leukocytosis. A few days after administration, a decrease in leukocyte count was observed, indicating that the patient responded well to Ceftriaxone therapy. However, midway through the treatment period, Ceftriaxone therapy was discontinued and replaced with a combination of imipenem-cilastatin, which belongs to the carbapenem class and is commonly used for severe or resistant infections. This change raised the suspicion that the physician considered a decrease in the effectiveness of Ceftriaxone. However, objectively, no clinical or laboratory evidence indicated therapeutic failure.

The administration of this antibiotic raised the potential for a DRP in the form of antibiotic therapy duplication, as the patient had already been receiving Ceftriaxone consistently since February 12, 2025. Objectively, the patient showed a favorable clinical response to ceftriaxone therapy, as indicated by decreased leukocyte levels and improvement of clinical symptoms. Therefore, the use of an additional broad-spectrum antibiotic without microbiological evidence was considered unnecessary. Laboratory results showed a decrease in leukocyte count, meaning that infection therapy with Ceftriaxone had been effective. According to Brunton et al.,[10] the administration of two broad-spectrum antibiotics simultaneously without clear indication falls into the DRP category of "unnecessary drug therapy." This not only adds a metabolic burden to the body but also increases the risk of adverse effects such as kidney damage, disruption of normal microbiota, and bacterial resistance. Billstein-Leber et al. also state that the use of additional antibiotics should be based on culture and sensitivity data or in cases of prior therapeutic failure, which in this case did not

occur.[8]

Therefore, the administration of the Imipenem and Cilastatin combination was deemed unnecessary and potentially harmful. The recommended pharmaceutical intervention is to discontinue Fiocilas and continue Ceftriaxone therapy with periodic monitoring of the patient's clinical condition and laboratory parameters.

In addition to pharmacological therapy, the patient was also advised on non-pharmacological measures. The patient was encouraged to consume a diet high in fiber and low in fat to support the healing process and maintain digestive health. According to Thompson, examples of foods that are high in fiber but low in fat include fresh vegetables such as spinach, broccoli, carrots, and green beans. Fruits such as apples (with skin), pears, strawberries, and papayas are also highly recommended as they are rich in soluble fiber, which helps maintain intestinal mucosa health.[11] Additionally, whole grains such as oatmeal, quinoa, brown rice, and whole wheat bread are sources of complex fiber that promote optimal bowel function. Legumes such as lentils and chickpeas are also good options, if they are consumed in appropriate portions to keep fat content low. Tubers such as sweet potatoes and cassava, when prepared without frying, can also be part of a healthy high-fiber diet.

It is important to avoid spicy, acidic, and high-fat foods as they may worsen symptoms or delay recovery. According to Zhao et al., examples of spicy foods include chili sauce, spicy curry, and chili-seasoned dishes such as *ayam rica-rica*. Acidic foods include citrus fruits (such as lemon, lime), tomato sauce, pickles, and carbonated beverages.[12] Examples of high-fat foods include fried snacks (such as fried bananas, vegetable fritters), fast-food burgers, pizza, French fries, sausages, and foods with concentrated coconut milk. It is also essential to ensure adequate fluid intake by drinking 2 to 2.5 liters of water per day. Adequate hydration is particularly important if the patient has fever or diarrhea, to prevent dehydration. The patient was also taught simple relaxation techniques such as deep breathing or light meditation to help naturally reduce pain.

Rationality of antibiotic use

In this case, the rationality of antibiotic use was evaluated based on the 5T principles: right indication, right patient, right drug, right dose, and right duration. According to right indication aspect, the administration of Ceftriaxone was deemed rational because the patient exhibited signs of acute bacterial infection: fever (38.5°C), leukocytosis (13,800/μL), and lymphopenia. Severe infections with systemic manifestations require broad-spectrum antibiotics such as Ceftriaxone to prevent serious complications.[8] According to right patient aspect, patient was 43 years old with no history of allergy to cephalosporins and had an active

infection, making them an appropriate candidate for Ceftriaxone therapy. According to right drug aspect, Ceftriaxone, a third-generation cephalosporin antibiotic, is effective against many gram-negative bacteria and some gram-positive bacteria. In the absence of culture results, the use of a broad-spectrum empiric antibiotic can be justified in cases of severe infection.[10] According to right dose and route of administration, a dose of 1 gram intravenous two times daily is in accordance with recommendations for the treatment of severe infections.[9] According to right duration, Ceftriaxone therapy was maintained as long as the patient remained in an active infectious state, with plans to switch to oral antibiotics (Cefixime) once the condition improved, in line with the principle of antibiotic de-escalation.[8]

Identification of inappropriateness

In the middle of the treatment period, the patient received an additional antibiotic, Fiocilas® (combination of Imipenem and Cilastatin). This additional antibiotic administration was considered irrational because there was no evidence of Ceftriaxone treatment failure. In addition, it was not based on culture results. Moreover, it increased the risk of side effects and bacterial resistance. According to previous study, the use of additional antibiotics without a clear indication falls under the category of *unnecessary drug therapy* and should be avoided to preserve long-term antibiotic effectiveness.[8] Therefore, a recommendation was made by discontinue Fiocilas® and continue intravenous Ceftriaxone with close clinical and laboratory monitoring. Finally, DRP in the present case is summarized in Table 5.

Table 5. Drug related problem of presented case.

No	Category	Description
1	Indication Without Therapy	No
2	Therapy Without Indication	No
3	Dose Too Low	No
4	Dose Too High	No
5	Adverse Reaction	No
6	Drug Interaction	No
7	Patients Not Using Medication	No
8	No Indication	Yes
9	Polypharmacy	Yes

This case has limitations due to its single-patient case study design, which limits the generalizability of the findings. However, this case provides valuable insight into the importance of drug therapy monitoring and rational antibiotic use in clinical practice.

Conclusion

Ceftriaxone therapy in this patient was rational and consistent with the 5T principles of appropriate antibiotic use. However, the addition of imipenem–cilastatin without documented clinical indication constituted a drug-related problem in the form of unnecessary drug therapy and potential polypharmacy. This case underscores the essential role of pharmacists in antimicrobial stewardship, ensuring rational drug use, minimizing resistance risk, and enhancing patient safety.

Conflict of Interest

The authors declare no conflicts of interest.

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Ethics and Patient Consent

This retrospective case report used anonymized patient data. Written informed consent for publication was obtained from the patient. Ethical approval was waived due to the non-interventional and retrospective nature of the study.

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