JOURNAL LA MEDIHEALTICO

VOL. 03, ISSUE 01 (006-015), 2022
DOI: 10.37899/journallamedihealtico.v3i1.549

# Evaluation of Antibiotics Treatment in Post Surgical RB2B Patients at H. Adam Malik Hospital

**Indra Ginting[1], Mayang sari[1], Sondang Ginting[2]**

*[1]Pharmacy Study Program, Faculty of Pharmacy and Health, Helvetia Institute of Health, Kapten Sumarsono Street 107, Medan, Sumatera Utara, Indonesia*
*[2]Student of the Faculty of Pharmacy, Helvetia Institute of Health, Medan, Indonesia*

**Corresponding Author: Indra Ginting*

Article Info

*Article history:*
Received 2 January 2022
Received in revised form 28 January 2022
Accepted 08 February 2022

*Keywords:*
Hypertension
Prescription
Hospital

**Abstract**

*Until now, antibiotics are still the mainstay of medicine in handling infectious disease cases. Antibiotics can be defined as compounds produced by various types of microorganisms (bacteria, fungi, actinomycetes) which can suppress the growth of other microorganisms. Postoperative is the postoperative period that starts when the patient is transferred to the recovery room and ends until the next evaluation. This research was conducted in the post-surgery room of H. Adam Malik Hospital Medan. This research objective is evaluation of antibiotic treatment in post-surgical RB2B patients at H. Adam Malik Hospital Medan. This type of research is non-experimental, quantitative descriptive that conducted at RB2B of H. Adam Malik Hospital Medan from May - September 2019. The sample was all post-surgical patients in RB2B who used antibiotics, amounted to 95 patients. Based on the research conducted, there were 4 groups of antibiotics treatment in Post- Surgery RB2B. The 4 groups namely Cephalosporins, Carbapenems, Nitroimidazoles and Quinolones. The most widely used postoperative antibiotic (RB2B) was Ceftriaxone, totalling 86 vials. Then followed by infusion of Metronidazole and 44 tablets. Then in the third place, the most used is Meropenem, as many as 13 vials. Followed by the use of cefotaxime and ciprofloxacin, 6. each. And finally, the least use, namely: Cefoperazone inj as many as 5 vials. The conclusion of this study was that 60% of antibiotics prescribed in RB2B had fulfilled the Fornas, while the discrepancy according to Fornas was 40%.*

## Introduction

H. Adam Malik Central General Hospital is a Government General Hospital which is a class A General Hospital, namely a General Hospital that has broad specialist and sub-specialist medical service facilities and capabilities which are educational facilities for nursing and non-nursing medical personnel. . In the H. Adam Malik Central General Hospital there are various types of services, such as services for oncology surgery, orthopedic surgery, neurosurgery, pediatric surgery and so on.

In general, patients who have finished surgery are given antibiotics prior to infection after surgery, the aim is to prevent infection due to surgery, namely surgical wound infection (ILO) or surgical site infection (surgical area). ILO is an infection that occurs at the surgical site (Schwartz et al., 2000). Post-surgery is the period after surgery that begins when the patient is transferred to the recovery room and ends until the next evaluation (Musrifatul & Hidayat, 2008).

Antibiotics are compounds produced by a microorganism that can kill or inhibit the growth of other microorganisms. The mechanism of action of antibiotics in killing bacteria is related to certain specific targets in bacterial cells so that they inhibit the metabolism of these bacterial cells. Antibiotics are very useful as drugs because they can kill bacteria that infect our bodies without harming body cells. Antibiotics are still the mainstay of drugs in handling cases of infectious diseases. Antibiotics can be defined as compounds produced by various types of microorganisms (bacteria, fungi, actinomycetes) that can suppress the growth of other microorganisms (Goodman, 2008). According to (Pelczar & Chan, (1988)t he word antibiotic is used for metabolic products produced by a particular organism which in very small amounts are destructive or inhibit the growth of other microorganisms. It is known that the use of antibiotics recently has increased tremendously, this is not only happening in developing countries but also in developed countries such as the United States. The Center for Disease Control and Prevention in the USA states that there are 50 million unnecessary antibiotic prescriptions out of 150 million prescriptions each year.

The high use of antibiotics can cause various problems and is a global threat to health because irrational use of antibiotics will cause bacterial resistance to antibiotics. This will complicate therapy with antibiotics in patients with infection, so that it will reduce the quality of health services. Initially resistance occurred in the hospital, but gradually it also developed in the community (Ministry of Health of the Republic of Indonesia, 2011). There is an increase in bacterial resistance to various antibiotics, including Staphylococcus aureus in resource-rich countries which are known to have additional resistance to gentamicin and ciprofloxacin, S. faecium which reaches 27% in the UK. In general, antibiotic prescribing is often suboptimal, not only in developing countries but also in developed countries. The widespread use of inappropriate antibiotics is a major public health and patient safety issue. Inappropriate use of antibiotics can cause various problems, including more expensive treatment, more toxic side effects, widespread resistance and the incidence of suprainfections that are difficult to treat.

Antibiotics or antimicrobials are drugs that are used as drugs to kill microbes, especially those that are harmful to humans. Antibiotics are substances produced by microbes, especially fungi that can inhibit the growth or eradicate other types of microbes (Ministry of Health of the Republic of Indonesia, 2011). Appropriate therapy using antibiotics must be able to prevent further bacterial proliferation without harming the host/patient. Antibiotics can be classified based on their mechanism of action against microorganisms, namely (Ministry of Health of the Republic of Indonesia, 2011); (1) Inhibit the synthesis or damage the bacterial cell wall, such as beta-lactams (penicillins, cephalosporins, monobactams, carbapenems, beta-lactamase inhibitors), bacitracin, and vancomycin); (2) Modify or inhibit protein synthesis, such as aminoglycosides, chloramphenicol, tetracycline, macrolides, clindamycin, mupirocin, and spectinomycin; (3) Inhibit essential enzymes in the metabolism of folate in bacteria (trimethoprim and sulfonamides); (4) Affects the synthesis or metabolism of nucleic acids (quinolones, and nitrofurantoin).

The most frequent errors in prescribing an antibiotic are the wrong drug selection and errors in dosage, duration, or route of administration (Mandal, 2004). There are several factors that must be considered in the use of antibiotics, namely; (a) Resistance of microorganisms to antibiotics; (b) Pharmacokinetic and pharmacodynamic factors of antibiotics; (c) Interaction factors and side effects of drugs; (d) Cost factor.

Based on their activity, antibiotics are divided into two major groups, namely; (a) Antibiotics that have broad spectrum activity, namely antibiotics that can kill Gram positive and negative bacteria and protozoa, which include broad spectrum antibiotics are Tetracycline and its derivatives, Chloramphenicol, Ampicillin; (b) Antibiotics that have a narrow activity (Narrow spectrum) are antibiotics that are only effective on certain bacteria. These antibiotics include

Penicillin, Polimixin B, streptomycin B, Bleomycin and Bacitraci (Sastramihardja & Herry (1997).

Antibiotics are the most widely used drug class in the world due to the high incidence of bacterial infections. More than a quarter of hospital budgets are spent on antibiotics use (World Health Organization, 2006).

The rational use of antibiotics is defined as giving the right antibiotic for the right indication, the right drug, the right dose and being aware of the side effects of the drug, the right interval for giving the drug, safe for administration and affordable for the patient. The irrational use of antibiotics has been observed for a long time. Reports from a hospital in America in 1977 revealed that 34% of all patients treated received antibiotic therapy (Sudoyo et al., 2006). Rational Medicine if the patient receives the drug, according to his needs, for an adequate period of time, at the lowest price for the community and practically the use of the drug is said to be rational if it meets the following criteria:

**Correct diagnosis**

The use of drugs is called rational if it is given for the right diagnosis, if there is an error in the diagnosis, the result is that the drug given will also not be as it should be (Madjid et al., 2007).

**In accordance with the indications of the disease**

The accuracy of the indication is related to determining whether or not a drug is given in a particular case (Sastramihardja & Herry, 1997).

**Proper drug selection**

Regarding the selection of therapeutic classes and types of drugs based on considerations of benefit, safety, price, and quality. As a reference, a treatment manual can be used (Sastramihardja & Herry, 1997).

**Right dose**

Giving excessive doses, especially for drugs with a narrow therapeutic range, will be very risky for side effects. Conversely, a dose that is too small will not guarantee the achievement of the expected therapeutic level (Sudoyo et al., 2006).

**The right way of giving**

The method of drug administration requires pharmacokinetic considerations, namely the method or route of administration, large dose, frequency of administration, and duration of administration, to the selection of the method of use that is easiest to follow. patients, is safe and effective for patients (Widjojo et al., 2009). d. Appropriate time interval of administration.

The method of drug administration should be made as simple and practical as possible so that it is easily understood and obeyed by the patient. The higher the frequency of drug administration per day, the lower the level of adherence to taking medication (Madjid et al., 2007); (1) Exactly the time of giving**,** The duration of drug administration must be appropriate according to each disease, can be adjusted to the algorithm for handling a certain type of disease, can also be adjusted to the gaudline of certain diseases (Madjid et al., 2007); (2) Be aware of side effects The administration of drugs has the potential to cause side effects, namely unwanted effects that arise when administering drugs with therapeutic doses (Madjid et al., 2007); (3) Assessment of the patient's condition. Accuracy of assessment is required of contraindications, influence of constitutional factors, comorbidities and history of allergies (Sastramihardja & Herry, 1997); (4) Accurate information. Accuracy of information related to information on how to use drugs, side effects of drugs and how to overcome them as well as the effect of adherence to treatment outcomes (Sastramihardja & Herry, 1997); (5) Appropriate in carrying out follow-up efforts. When deciding on therapy, the necessary follow-up efforts

should be considered, for example if the patient does not recover or experiences side effects. If this happens then the dose of the drug needs to be reviewed or the drug may be changed (Madjid et al., 2007); (6) Drugs that are effective, safe, quality guaranteed and affordable. The selection of drugs in the list of essential drugs is carried out by considering their effectiveness, safety and price by the prescriber in carrying out therapy (Madjid et al., 2007); (7) Correct delivery of drugs.The rational use of drugs also involves the dispenser as the drug provider and the patient as the consumer. When the prescription is brought to the pharmacy or the place of drug delivery, the pharmacist/assistant/drug dispensing officer will carry out the doctor's order/prescription written on the prescription sheet to be then given to the patient (Madjid et al., 2007).

The patient complies with the required medication orders. Disobedience to taking medication generally occurs in the following events: (1)The type and or amount of medication given is too much; (2) The frequency of drug administration per day is too frequent; (3) Types of drug preparations are too diverse; (4) Long-term administration of drugs; (5) The patient does not get sufficient information or explanation about how to take or use the drug.

**Post-surgery is the period after surgery**

begins when the patient is transferred to the recovery room and ends until the next evaluation (Musrifatul & Hidayat, 2008; Uliyah & Hidayat, 2006). The post-surgical stage begins with transferring the patient from the operating room to the post-surgical unit and ends when the patient returns home. According to Baradero, post-surgical complications that will arise include hypotension and hypertension. Hypotension was defined as a systolic blood pressure of less than 70 mmHg or a decrease of more than 25% from the previous value (Baradero, 2008). Hypotension can be caused by hypovolemia resulting from bleeding and anesthetic drug overdose.

Hypertension is caused by inadequate analgesia and hypnosis, cough, untreated hypertensive disease, and inadequate ventilation. Meanwhile, according to Majid, post-surgical complications are bleeding with clinical manifestations, namely restlessness, restlessness, constantly moving, feeling thirsty, cold skin, wet, pale, increased pulse, decreased temperature, rapid and deep breathing, pale lips and conjunctiva and weakened patient (Majid, 2011).

The H. Adam Malik Central General Hospital is a class A hospital in accordance with the Decree of the Minister of Health Number 335/Menkes/SK/VII/1990 which is located on Jl. Flower Lau No. 17 Medan Tuntungan, Medan City, North Sumatra Province. H. Adam Malik Hospital was designated as a Teaching Hospital in accordance with the Decree of the Minister of Health Number 502/Menkes/SK/IX/1991. RSUP H. Adam Malik is also the Center for Reference for Development A, which includes the Provinces of North Sumatra, Nanggore Aceh Darussalam, West Sumatra and Riau.

## Methods

This type of research is descriptive quantitative. This study is about evaluating the use of antibiotics in patients after RB2B surgery at H. Adam Malik Hospital Medan which is observational. The data used in this study was carried out retrospectively by tracing the medical records of patients after RB2B surgery who used antibiotics at H. Adam Malik Hospital, Medan.

The population in this study were all post-surgical RB2B patients at H. Adam Malik Hospital Medan for the period July-December 2018. The sampling technique in this study used non-probability sampling with purposive sampling technique. The formula for calculating the sample size is based on the Slovin Formula, the sample taken is 95 people randomly (random sampling). This research was conducted in the medical records section of the inpatient

installation of H. Adam Malik Hospital Medan and the time of this study was conducted from May-September 2019.

In data collection there are two kinds of criteria that must be met, namely Inclusion Criteria; (1) Medical records of post-surgical patients RB2B RSUP H. Adam Malik Medan who received antibiotic prescriptions for the period July-December 2018; (2) Medical records with complete data on the use of antibiotics. Exclusion Criteria; (1) Patients who are forced to go home or die before the program of giving antibiotics to patients is complete; (2) Patients whose therapy is continued or referred to another hospital; (3) Medical records that are not clearly legible and cannot be confirmed for clarity.

The way this research works is as follows:

**Stage I: Preparation**

The preparatory stage was carried out in January 2018. At this stage the researchers looked for a literature review related to the research to be carried out. After that, the researcher worked on a research proposal and took care of a permit letter to carry out research at H. Adam Malik Hospital Medan.

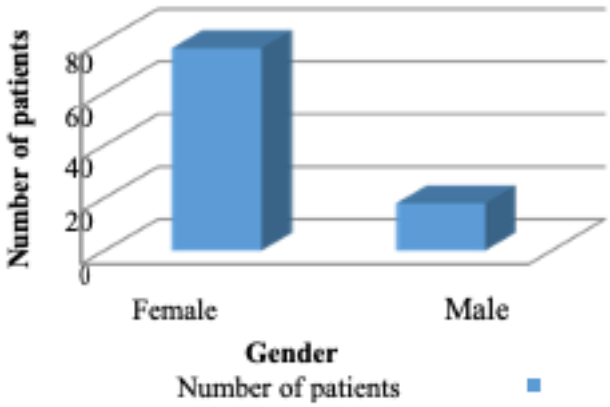
**Phase II: Implementation**

The implementation phase was carried out in May-September 2019, including data collection using the random sampling method. Furthermore, the researchers analyzed the patient's medical record data included in the inclusion criteria.

## Results and Discussion

Central General Hospital H. Adam Malik, is a Type A hospital located on Jl. Bunga Lau No.17, Victory Farmers, Kec. Medan Tuntungan, Medan City, North Sumatra 20136. The number of samples of postoperative patients who used antibiotics according to the inclusion characteristics were 95 people.

**Distribution of Patients by Gender**




Based on a graph of 4.1 the number of patients with male sex as many as 77 patients. While the female patients as many as 18 people.

**Distribution of Antibiotics by Group**

Table 1. Antibiotics used in RB2B RSUP H. Adam Malik Medan By Group

| No. | Antibiotics | Name of antibiotic | Dosage Form |
|---|---|---|---|
| 1 | Cephalosporin | Seftriakson 1 g | Injection |
| 2 | Cephalosporin | Sefotaksim 0.5 g | Injection |
| 3 | Cephalosporin | Sefoperazon 1 g | Injection |

| | | | |
|---|---|---|---|
| 4 | Karbapenem | Meropenem 1 g | Injection |
| 5 | Nitroimidazole | Metronidazole 0.5g/ml | Infusion, tablets |
| 6 | Quinolon | Siprofloxaxan 0.2g/ml | Infusion, tablets |

Based on table 4.2, there are 4 groups of antibiotics used in RB2B Post Surgery. The 4 groups are cephalosporins, carbapenems, nitroimidazoles and quinolones. In the cephalosporin group, the names of the antibiotics used are: ceftriaxone, cefotaxime and cefoperazone. While in the Carbapenem group, the antibiotic used is Meropenem. While in the Nitroimidazole group, the antibiotic used is Metronidazole. While in the Quinolones group, the antibiotic used is ciproflixacin.

**Distribution of Antibiotics Based on the Number of Antibiotics Used**

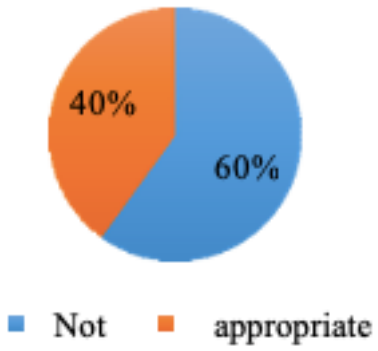
Table 2. Antibiotics used in RB2B H. Adam Malik Hospital Medan by Amount

| No | Name Antibiotic | Sum | Percentage |
|---|---|---|---|
| 1 | Seftriakson 1 g | 86 | 54% |
| 2 | Sefotaksim 0.5 g | 6 | 4% |
| 3 | Sefoperazon 1 g | 5 | 3% |
| 4 | Meropenem 1 g | 13 | 8% |
| 5 | Metronidazole 0,5g/ml | 44 | 27% |
| 6 | Siprofloksasin 0,2g/ml | 6 | 4% |

Based on table 4.3, the most widely used postoperative antibiotic (RB2B) was Ceftriaxone, with 86 vials. Then followed by Metronidazole infusion and tablets as many as 44 pieces. Then the third most used is Meropenem, as many as 13 vials. Followed by the use of cefotaxime and ciprofloxacin, each 6. And finally, the use of the least, namely: Cefoperazone inj as much as 5 vials.

**Compatibility of Antibiotics Based on Fornas**

Graph 4.3. The Suitability of Antibiotics Used in RB2B H. Adam Malik Hospital Medan Based on the National Formulary Used by H. Adam Malik Hospital for the Period of July-December 2018




Based on the data that has been obtained, it can be concluded that, the prescribing of antibiotics in RB2B that has met Fornas as much as 60%, while nonconformity according to Fornas as much as 40%.

The number of patients with male gender was 77 patients. While the female patients were 18 people. The number of samples according to the inclusion observed the number of antibiotic use as many as 95 patients.

There are 4 groups of antibiotics used in post-surgery RB2B. The 4 groups are cephalosporins, carbapenems, nitroimidazoles and quinolones. In the cephalosporin group, the names of the antibiotics used are: ceftriaxone, cefotaxime and cefoperazone. While in the Carbapenem

group, the antibiotic used is Meropenem. While in the Nitroimidazole group, the antibiotic used is Metronidazole. While in the Quinolones group, the antibiotic used is ciproflixacin. Cephalosporin antibiotics are widely used in various health institutions including hospitals, because these cephalosporins have several advantages, namely being active against Gram-positive and Gram-negative bacteria, but the spectrum of each antibiotic varies. The first generation is the most effective against gram-positive but has a narrower antibacterial spectrum compared to the next generation, especially active against Cocus. Except for Enterococcus, E.coli, Salmonella sp., K, pneumoniae (Flum, 2015). Indications for the first generation are to treat surgical skin infections and contamination due to skin flora. Second-generation cephalosporins are slightly less active against Gram-positive bacteria but more active against Gram-negative bacteria (Flum, 2015).

All of these antibiotics are given parenterally and intramuscularly because they are not resistant to gastric acid. The third generation is even more active against Gram negative, including Enterobacteriaceae and Pseudomonas which have a broad spectrum. The spectrum of antibiotics is broad compared to the previous generation, in general this antibiotic derivative is active against Gram-negative bacteria which are more resistant to beta-lactamase, but less effective against Gram-positive bacteria. The cephalosporin used is ceftriaxone which is a third generation cephalosporin that is active against Enterobacteria. Ceftriaxone is effective against Gram positive infections such as Staphylococcus sp, and Streptococcus sp, as well as Gram negative anaerobic B. fragilis. Ceftriaxone is not resistant to gastric acid and is therefore given IV and IM with a half-life of 8 hours. Ceftriaxone is the most widely used on the grounds of having a good therapeutic index, low toxicity, good tissue penetration, no coagulation problems, and the longest half-life of all cephalosporins (Flum, 2015).

The most widely used postoperative antibiotic (RB2B) was Ceftriaxone, as many as 86 vials. Drug data in Indonesia states that ceftriaxone is a semisynthetic broad-spectrum cephalosporin administered intravenously or intramuscularly. Ceftriaxone has high stability to beta-lactamases, both to penicillinase and cephalosporinase produced by gram-negative and gram-positive bacteria. This type of antibiotic has the ability to fight gram-negative bacilli commonly found in gastrointestinal surgery such as Streptococcus fecalis. Ceftriaxone is combined with metronidazole to eradicate anaerobic bacteria encountered in gastrointestinal surgery. Anaerobic bacteria that are often found in gastrointestinal surgery, especially appendicitis are Bacteroides fragilis which is found in more than 70% of cases of appendicitis, and Streptococcus fecalis which is a gram-negative anaerobic bacterium (Prystowsky et al., 2005).

Ceftriaxone has several advantages so that it is more widely used, namely: (1) ceftriaxone is able to fight gram-negative bacilli found in the gastrointestinal tract; (2) ceftriaxone is included in the list of drugs covered by BPJS; (3) the half-life of ceftriaxone is quite long (5-9 hours) so that the administration of the drug to the patient is not frequent and will provide comfort to the patient; (4) ceftriaxone is safe to use and does not require dose adjustment if given to patients with renal and hepatic insufficiency. The Ministry of Health recommends first or second generation cephalosporins for surgical prophylaxis, while in this study only second and third generation cephalosporins were used as prophylactic antibiotics (5). The bacteria most isolated from surgical wound infections were Staphylococcus aureus, coagulase-negative coagulase-negative staphylococci, Enterococcus faecalis, Escherichia coli, and Pseudomonas aeruginosa (26-28). Based on the germ pattern, one of the hospitals in Indonesia is Streptococcus fecalis which is now known as Enterococcus faecalis. The cephalosporins are divided into four generations. Based on the bacterial pattern and the mechanism of action of the cephalosporin class of antibiotics, the third generation cephalosporin is the appropriate type of antibiotic, because although it is generally less active against gram-positive cocci than the first generation, it is much more active against Enterobacteriaceae, including penicillinase-producing strains (Oh et al., 2014).

While the second generation is not effective against Pseudomonas aeruginosa and enterococci, as well as the first generation there have been several resistant bacteria including MRSA, Staphylococcus epidermidis and Streptococcus faecalis. Similar results were obtained from a study that showed no significant difference between the effectiveness of the first generation cephalosporins compared to the second and third cephalosporins as prophylactic antibiotics in reducing the incidence of surgical wound infections (Oh et al., 2014). The third generation cephalosporins are more widely used because of their broad spectrum and are still widely available in generic dosage forms compared to the second generation which is only available in branded dosage forms because the second generation generic preparations (cefuroxime) are no longer produced in Indonesia. However, excessive use of third-generation cephalosporins can cause Methicillin Resistant Staphylococcus Aureus (MRSA) and Extended Spectrum Beta Lactamase (ESBL), and pose a potential threat of resistance, so caution is needed in the selection of surgical prophylactic antibiotics (Anand et al., 2011).

Then followed by Metronidazole infusion and tablets as many as 44 pieces. Metronidazole is known as an antibacterial, antiprotozoal and radiation-sensitizer. Antibacterial in preventing the spread of infectious agents or killing the infectious agents so that they do not spread. Its mechanism of action is to inhibit nucleic acid synthesis by damaging DNA (ACOG, 2010).

As an antiprotozoa, metronidazole works by destroying these protozoa. Meanwhile, as a radiation-sensitizer, metronidazole is effectively capable of damaging unwanted cells (ACOG, 2010). Is a type of antibiotic indicated to treat diseases caused by gram-negative anaerobic bacilli infection; Bacteroides fragilis species (B. diastonic, B. ovatus, B. thetaiotaomicron, B. vulgatus), gram-positive anaerobic bacillus; Clostridium species and Eubacterium species, gram-positive anaerobic cocci; Peptococcus species, Peptostreptococcus species and other bacteria. In addition, metronidazole is also used as an antiprotozoal in Trichomonas vaginalis and amoebic infections.

Then the third most used is Meropenem, as many as 13 vials. Carbapenems are third-line antibiotics that have a wider range of antibiotic activity than most other beta-lactams. Carbapenems include imipenem, meropenem and doripenem. Spectrum of activity: Inhibits most Gram-positive, Gram-negative, and anaerobes. All three are highly resistant to beta-lactamase. Side effects: nausea and vomiting, and convulsions at high doses are most common in patients with CNS lesions or with renal insufficiency. Meropenem and doripenem have similar efficacy to imipenem, but are less likely to cause seizures (Ministry of Health of the Republic of Indonesia, 2011).

This was followed by the use of cefotaxime and ciprofloxacin, respectively 6. Cefotaxime is a third generation cephalosporin indicated as an antibiotic to reduce the risk of surgical infection which is active against Gram positive and Gram negative bacteria (Siswandono, 1995). Cefotaxime activity is greater against Gram-negative bacteria while activity against bacteria is smaller, but some Streptococci are very sensitive to cefotaxime Cefotaxime antibiotics are poorly absorbed in the digestive tract, so they are given IV and IM, and have a short half-life of 1 hour. Cefotaxime is a broad-spectrum antibiotic that can alter the normal gut flora and may cause Clostridia overgrowth (Wells et al., 2009). According to Wells in 2009, for appendicitis without gangrene, it is recommended that perforations only be given antibiotics that are active against facultative and obligate anaerobes, and are inexpensive and effective at small concentrations.

And finally, the least used are: Cefoperazone inj as much as 5 vials. Cefoperazone is a third-generation semi-synthetic cephalosporin with a broad spectrum of activity against the majority of aerobic and anaerobic gram-positive and gram-negative bacteria in vitro (Ministry of Health of the Republic of Indonesia, 2011).

Based on the data that has been obtained, it can be concluded that 60% of the antibiotic prescriptions in RB2B have complied with the Fornas, while the discrepancy according to the Fornas is 40%. This is of particular concern, because uncontrolled use of antibiotics can lead to patient resistance. This is because doctors prescribe copy-paste drugs, which causes the use of drugs, especially antibiotics, to be out of control and changing doctors causes the prescribing of antibiotics to become out of control. It is necessary to hold socialization and warnings to doctors regarding prescribing especially antibiotics and drugs that are included in the Fornas restriction. This control is very important to do, to control the dispensing of drugs to patients and to maintain antibiotic resistance to patients.

## Conclusion

There are 4 groups of antibiotics used in post-surgery RB2B. The 4 groups are cephalosporins, carbapenems, nitroimidazoles and quinolones. In the cephalosporin group, the names of the antibiotics used are: ceftriaxone, cefotaxime and cefoperazone. While in the Carbapenem group, the antibiotic used is Meropenem. While in the Nitroimidazole group, the antibiotic used is Metronidazole. While in the Quinolones group, the antibiotic used is ciproflixacin. The most widely used postoperative antibiotic (RB2B) is ceftriaxone which belongs to the third cephalosporin class of antibiotics. Antibiotic prescribing in RB2B during July-December 2018, which has complied with Fornas as much as 60%, while the discrepancy according to Fornas is 40%.

## References


ACOG. (2010). *Antimicrobial Prophylaxis for Cesarean Delivery*: Timing of Adsminitration.

Anand, N., Dinesh M &Anupama. (2011). Comparison of combinations of ciprofloxacin-metronidazole and ceftriaxone-metronidazole in controlling operative site infections and gynecological surgeries: A retrospective study. *Journal of Pharmacology and Pharmacotherapeutics.*

Baradero. (2008). *Prinsip dan Praktek Keperawatan Perioperatif*. Jakarta: EGC.

Flum, D. R. (2015). Acute appendicitis—appendectomy or the "antibiotics first" strategy. *New England Journal of Medicine*, *372*(20), 1937-1943.

Goodman, G. (2008). *Farmakologi Terapi*. Jakarta: Penerbit Buku Kedokteran EGC; 2008.

Kementrian Kesehatan Republik Indonesia. (2011). Pedoman Pelayanan Kefarmasian Untuk Terapi Antibiotika Kementrian Kesehatan Republik Indonesia.

Madjid, M., Miller, C. C., Zarubaev, V. V., Marinich, I. G., Kiselev, O. I., Lobzin, Y. V., ... & Casscells III, S. W. (2007). Influenza epidemics and acute respiratory disease activity are associated with a surge in autopsy-confirmed coronary heart disease death: results from 8 years of autopsies in 34 892 subjects. *European heart journal*, *28*(10), 1205-1210.

Majid, A. (2011). *Keperawatan Perioperatif*. I. Yogyakarta: Goysen Publishing.

Musrifatul U & Hidayat A.A. A. (2008). *Keterampilan Dasar Praktik Klinik Untuk Kebidanan*. Jakarta: Salemba Medika.

Oh, A.L., Goh, L.M., Azim, N.A.N., Tee, C.S., Phung CWS. (2014). Antibiotic usage in surgical prophylaxis: a prospective surveillance of surgical wards at a tertiary hospital in Malaysia. 2014.

Palikhe, N., Pokharel A. Prescribing regimes of prophylactic antibiotic used in different surgeries. India: Kathmandu Univ; 2004.

Pelczar, M. J., & Chan, E. C. S. (1988). *Dasar-dasar mikrobiologi Jilid 2*. Jakarta: Universitas Indonesia.

Prystowsky, J.B., Pugh, C.M., Nagle A. (2005). Appendicitis. 2005.

Sastramihardja, W. & Herry, S. (1997). Penggunaan Antibiotik Yang Rasional. I. Jakarta: IDI

Schwartz, S. I., Shires, G. T., & Spencer, F. T. (2000). Intisari prinsip-prinsip ilmu bedah. *Laniyati dkk (Penerjemah). Edisi ke-6. Jakarta: EGC*.

Siswandono, S. B. (1995). *Kimia Medisinal: Antibiotika*. Airlangga University Press.

Sudoyo, W. A, Setiyohadi B, Alwi I, Marcellus Simadibrata K. S. S. (2006). Buku Ajar Ilmu Penyakit Dalam. IV. Jakarta: Pusat Penerbian Departement Ilmu Penyakit Dalam Fakultas Kedokteran Universitas Indonesia.

Uliyah, M. & Hidayat A. (2006). *Keterampilan Dasar Praktik Klinik Kebidanan*. Jakarta: Salemba Medika

Wells B. G, Dipiro J. T, Swhinghammer T. L D. C. (2009). *Pharmacotherapy Handbook: Infectious Disease. Seventh ed.* Newyork: The MC Graw-Hill Companies Inc

Widjojo, P., Surastri, B., Wijayahadi, N., & Nugraha, T. L. (2009). Pengantar Kuliah Farmakologi Teurapeutik I.

World Health Organization. (2006). Implementing the new recommendations on the clinical management of diarrhoea: guidelines for policy makers and programme managers.