UTILIZATION ANALYSIS OF ANTIBIOTICS FOR TYPHOID FEVER IN HOSPITALIZED PATIENT IN 2010 AND 2011 AT X HOSPITAL IN BANTUL WITH ATC/DDDMETHOD

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Abstract

Backgroud. *Typhoid fever caused by Salmonella typhi is still endemic disease in Indonesia. Antibioticis a group of drugs often used today to treat typhoid fever.*

Objectives. *The purpose of this study was to determine the pattern of antibiotic use for treatment of typhoid fever in hospitalized patients, the suitability of the use of antibiotics were comparedto the hospital formulary and DOEN.Futher more the change of antibiotic usage patterns of typhoid fever in hospitalized patients in 2010 and 2011 atX hospital in Bantulwas seen from the DU90%.*

Method. *The study design was descriptive.We used ATC/DDD as means to increase the quality use of medicines with an average maintenance dose per day was estimated for the adult indication. The study subjects were all data of antibiotics used for treatment of typhoid fever in adult patients hospitalized at X hospiltal in Bantul in 2010 and 2011were obtained in medical record.*

Outcame :*This study of ultization medicine was to increase quality use of antibiotic for thypoid fever treatment especialy for hospitalized patient.*

Results. *The antibiotic use for treatment of typhoid fever in hospitalized patientsin 2010 were ceftriaxone (45,83 DDD/100days), cefrozil (19,87 DDD/100days), ciprofloxacin (11,28 DDD/100days), cefixime (6,73 DDD/100days), levofloxacin (3,21 DDD/100days), ceftazidime (1,60 DDD/100days), cefadroxil (0,64 DDD/100days). In 2011 antibioticsuse for treatment of typhoid fever in hospitalized patients were ceftriaxone (96,79 DDD/100days), ciprofloxacin (15,51 DDD/100days), levofloxacin (12,82 DDD/100days), cefotaxime (11,54 DDD/100days), azithromycin (3,21 DDD/100days), ceftazidime (2,56 DDD/100days), metronidazol (2,56 DDD/100days), cefadroxil (1,28 DDD/100days), ofloxacin (1,28 DDD/100days).*

Conclusions. *Most antibiotic used in 2010 and 2011 was ceftriaxone. In 2010 the appropriate antibiotic usedaccording to hospital formulary were 89% while in 2011,reached into 100%. The use of antibiotics that also existed in DOEN were cefriaxone and ciprofloxacin. There were two different antibiotic used in 2010 and 2011, which were levofloxacin and cefotaxim (2010) and cefprozil and cefixime (2011). However ceftriaxone and ciprofloxacin still used in 2010 and 2011.*

Keywords : *Typhoid Fever, Antibiotics, ATC/DDD, DU90%.*

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INTRODUCTION

Typhoid fever still remains a health problem in developing countries, mostly in the tropics such as in Indonesia, where the case number increase in the season and at the beginning of the rainy season. Incidence number of typhoid fever in Indonesia on average 900,000 cases / year with a mortality rate more than 20,000 which 91% of cases occur in age of 3 -19 years.

In the last four decades, typhoid fever has become a global health problem. The incidence number of this disease estimated reach 13 – 17 million cases worldwide with a mortality rate of up to 600,000 people per year. Endemic typhoid fever spread across various continents, from Asia, Africa, South America, the Caribbean, to Oceania. The majority of cases (80%) are found in developing countries, such as Bangladesh, Laos, Nepal, Pakistan, India, Vietnam, and including Indonesia.

Antibioticis a group of drugs often used today to treat typhoid fever. Selection of appropriate antibiotics in patients with typhoid fever is very important, because it can prevent complications and reduce mortality.

OBJECTIVES

The purpose of this study was to determine the pattern of antibiotic use for treatment of typhoid fever in hospitalized patients, the suitability of the use of antibiotics were compared to the hospital formulary and DOEN.Futher more the change of antibiotic usage patterns of typhoid fever in hospitalized patients in 2010 and 2011 atX hospital in Bantulwas seen from the DU90%.

METHODS

The study design was descriptive.We used ATC/DDD as means to increase the quality use of medicines with an average maintenance dose per day was estimated for the adult indication. The study subjects were all data of antibiotics used for treatment of typhoid fever in adult patients hospitalized at X hospiltal in Bantul in 2010 and 2011 were obtained in medical record.

Outcame

We hope this study of utilization drug can increase knowledge about application methods ATC / DDD in the study of drug use.Provide an overview of the suitability of antibiotic therapy in the treatment of typhoid in the hospital formulary and its concept.Provide an overview of information regarding the use of antibiotics in the treatment of typhoid patients was particularly useful for pharmacy in pharmaceutical management.This study was expected to be the input for other researchers on the analysis of ATC / DDD.Also the important was to increase the quality use of antibiotic for thypoid fever treatment especialy for hospitalized patient.

RESULTS

Types and quantity of antibiotics for thypiod fever treatment of adult patients hospitalized were obtained from medical record card X hospital in Bantul. Rute of administration of antibioticmustobtain concernbecause in the ATC / DDD there are some medications with different values DDD between oral and parenteral administration.To determine the quantity use of antibiotic in thypiod fever patients using DDD based WHO Collaborating Center for Stasistic Methodology in 2010. Number of inpatient days in this study were obtained from the number of days of hospitalization entire adult typhoid fever patients for one year. Adult typhoid fever patients hospitalized at X hospital in Bantul in 2010 was 468 days whereas in 2011 was 468 days. Data on the number of stay is needed to calculate the use of antibiotics in the inpatient unit of DDD/100.

Antibiotic utilization data shown on the table below.

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Table I. Antibiotic use for typhoid fever in 2010

Generic name	DDD/100 bed days	% use	Cumulative	Segment
Ceftriaxone	45.83	51.40	51.40	DU 90%
Cefrozil	19.87	22.29	73.69	
Ciprofloxacin	11.28	12.65	86.34	
Cefixime	6.73	7.55	93.99	
Levofloxacin	3.21	3.60	97.59	10%
Ceftazidime	1.60	1.79	99.37	
Cefadroxil	0.64	0.73	100	

Table II. Antibiotic use for typhoid fever in 2011

Generic name	DDD/100 bed days	% use	C umulative	Segment
Ceftriaxone	96,79	65,60	65,60	DU 90%
Ciprofloxacin	15,51	10,51	76,11	
Levofloxacin	12,82	8,69	84,80	
Cefotaxime	11,54	7,82	92,62	
Azithromycin	3,21	2,18	94,80	10 %
Ceftazidime	2,56	1,73	96,53	
Metronidazole	2,56	1,73	98,26	
Cefadroxil	1,28	0,87	99,13	
Ofloxacin	1,28	0,87	100	

From the table I and the table II it can be seen that thehighest antibiotic use for patients with typhoid fever are 3rdcephalosporins, namely ceftriaxone, this may be due to sefalosforin have high stability against gram-negative and gram-positive thus more effective in killing the bacteria that causes typhoid fever (Tan and Rahardja, 2007).

In small-scale study (Sutardi 2010), ceftriaxone was more effective when given only 2-3 days although recurrence rates with short-term treatment can not always be measured.Some studies show the superiority of ceftriaxone as antibiotic selected for typhoid fever.

In 2010 antibiotics were included in segment DU90% is ceftriaxone, cefrozil, cefixime and ciprofloxacin. Whereas in 2011 the antibiotics included in the segment DU90% is ceftriaxone, cefotaxime, ciprofloxacin and levofloxacin. There was a difference when compared segment DU90% use of antibiotics in the treatment of typhoid fever between 2010 and 2011. The use of levofloxacin increased in 2011, this shows a shift in the use of antibiotic class quinolones is more widely used for the treatment of typhoid fever than the epidemic in 2010.

Table III. Antibiotic use in 2010 compare to hospital formulary and DOEN

Types	Patent name	Generic name	Rute	Hospital formulary	DOEN
1st cephalosporins	-	Cefadroxil	Oral	√	
2nd cephalosporins	Lizor	Cefrozil	Oral	√	
3rd cephalosporins	-	Ceftriaxone	Parenteral	√	√
	Zidifec	Ceftriaxone	Parenteral	√	√
	Elpicef	Ceftriaxone	Parenteral	√	
	-	Cefixime	Oral	√	
	Fixiphar	Cefixime	Oral	-	
	Maxpro	Cefixime	Oral	√	
Quinolon	-	Ciprofloxacin	Oral dan parenteral	√	√ (oral)
	Cravox	Levofloxacin	Oral	√	

√ = appropiate , - = not appropiate

From the table III, use of antibiotics in 2010, there was 1 (11%) types of antibiotics that are not included in the hospital formulary, which Fixiphar that is the trademark of cefixime. While in 2011 (table IV) all of antibiotics (100%) which is used to treat typhoid fever was accordance with the hospital formulary. It has a good indication, means the doctor has complied with the hospital formulary and ensure patients obtain prescription drugs.

Table IV. Antibiotic use in 2011 compare to hospital formulary and DOEN

Types	Patent name	Generic name	Rute	Hospital formulary	DOEN
1stcephalosporins	-	Cefadroxil	Oral	√	
3rdcephalosporins	-	Cefotaxime	Parenteral	√	
	-	Ceftazidime	Parenteral	√	
	-	Ceftriaxone	Parenteral	√	√
	Elpicef	Ceftriaxone	Parenteral	√	√
	Strarxon	Ceftriaxone	Parenteral	√	√
Quinolon	-	Ofloxacin	Oral	√	
	-	Ciprofloxacin	Oral dan parenteral	√	√ (oral)
	Cetafloxo	Cetafloxo	Parenteral	√	
	-	Levofloxacin	Oral	√	
	Cravox	Levofloxacin	Parenteral	√	
	Cravit	Levofloxacin	Oral	√	
Makrolide	-	Azithromycin	Oral	√	
Imidazole	-	Metronidazole	Parenteral	√	√

√= appropiate , - = not appropiate

DOEN was an essential drug list which was very important for supply drug in Indonesia. DOEN were structured to ensure the availability of drugs that seem to be more equal and accessible by the public. Antibiotics used for typhoid fever in hospitalized adult patients at X hospital in Bantul in 2010 and 2011 were ceftriaxone and ciprofloxacin contained in the list.

CONCLUSIONS

Most antibiotic used in 2010 and 2011 was ceftriaxone. In 2010 the appropriate antibiotic used according to hospital formulary were 89% while in 2011, reached into 100%. The use of antibiotics that also existed in DOEN were cefriaxone and ciprofloxacin. There were two different antibiotic used in 2010 and 2011, which were levofloxacin and cefotaxim (2010) and cefprozil and cefixime (2011). However ceftriaxone and ciprofloxacin still used in 2010 and 2011.

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