EVALUATION CEPHALOSPORIN OF ANTIBIOTICS IN THE INTENSIVE CARE UNIT (ICU) GENERAL HOSPITAL CENTER SOUTH JAKARTA

Lili Musnelina, Irma Dini Pratiwi

Department of Pharmacy, Institute of Science and Technology of National

Background:

Antibiotics are the most commonly prescribed drug for a patient in hospitalization. According to estimates by up to one third of hospitalized patients received antibiotics, and antibiotic costs can reach 50% of the budget for medicines in hospitals. Additionally, high rates nosocomial infections in the intensive care unit (ICU) is more common compared with usual care patients in the ward. According to previous research, cephalosporin class of antibiotics is the most widely used antibiotics in the ICU because this group is still considered the best antibiotic.

Objective:

This study aimed to evaluate the use of the cephalosporin class of antibiotics in terms of dosing and levels of use, and the sensitivity of bacteria to see the results of culture and sensitivity test.

Methods:

This study uses cross sectional descriptive analytic with prospective data collection. Criteria for patients in the sample was hospitalized in ICU in the period from August to October 2009 using the cephalosporin class of antibiotics, which have a data culture and sensitivity test results, and data on laboratory levels of urea and creatinine. The data has been collected, then analyzed using parametric analysis of the chi square test (SPSS 16).

Results:

Table 1: The use of AB class of cephalosporins in the ICU based on age and duration of use

Cephalosporin antibiotics (Generation)		Total sample		age					∑ Usage	Length delivery (days)				∑ usage
		n	%	child	adolescent	adult	Old	elderly		1 sd 3	4 sd 5	6 sd 8	9 sd 12	
III	Cefoperazone	4	7.55	-	-	1	1	2	4	1	2	1	-	4
	Ceftriaxone	44	83.02	4	2	16	15	7	44	32	6	3	3	44
	Ceftazidime	3	5.66	-	-	-	2	1	3	1	-	-	2	3
IV	Cefepime	1	1.89	-	-	-	1	-	1	1	-	-	-	1
	Cefpirome	1	1.89	-	-	-	1	-	1	1	-	-	-	1
Total sample		53	100						53					53

Table 2: The use of antibiotics based on combination with other antimicrobial

The combination of cephalosporin	number of combinations	
	n	%
Ceftriaxone – class of aminoglycoside	1	1.89
Ceftriaxone – class of quinolones	1	1.89
ceftazidim – class of quinolones	1	1.89
cefoperazon – class of quinolones	2	3.77
Ceftriaxone – class of Makrolida	2	3.77
Ceftriaxone - Metronidazole	7	13.21
Ceftazidime- Metronidazole	1	1.89
Ceftriaxone - Group of aminoglycosides - Metronidazole	1	1.89
Ceftriaxone - Group of quinolones - Metronidazole	4	7.55
Not combined	33	62.26
Total sample	53	100

Cephalosporin class of antibiotics effective for aerobic bacterial infection, whereas metronidazole includes most Gram-negative anaerobic bacteria and protozoa.

Table 3: Sensitivity of bacteria to the antibiotic cephalosporin class

Isolates	Cephalosporin antibiotic sensitivity			Frequency of testing	%		
	R	I	S		R	I	S
Escherichia coli	-	1	6	7	0.00	14.29	85.71
Klebsiella pneumoniae	27	1	-	28	96.43	3.57	0.00
Pseudomonas aeruginosa	15	3	3	21	71.43	14.29	14.29
Enterobacter aerogenes	20	1	-	21	95.24	4.76	0.00
Serratia liquefaciens	3	1	3	7	42.86	14.29	42.86
Klebsiella ozaneae	12	1	1	14	85.71	7.14	7.14
Staphylococcus epidermidis	4	1	2	7	57.14	14.29	28.57

This is caused by strains of Klebsiella have the R-plasmids that can inactivate antibiotics, besides, K. pneumoniae can produce enzymes that can menginaktif betalaktamase betalaktam antibiotics such as penicillin, cephalosporin.

Table 4: Evaluation of use of the cephalosporin class of antibiotics based on the accuracy of dose

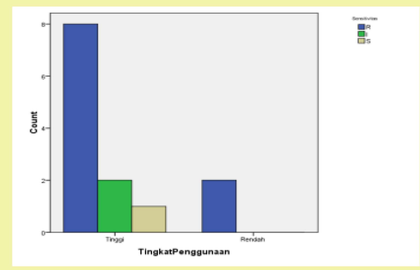
Dosing Accuracy		Total Sample	
		n	%
Exactly	right dose and interval	46	86.79
Not Exactly	Dose interval exact but not exact	1	1.89
	less precise dose interval exact	6	11.32
Total sample		53	100

The dose given is less than the recommended dose may cause libraries are not up to the achievement of therapeutic effects and occurrence of resistance, while if the dose exceeds the recommended dosage libraries can increase side effects such as impaired renal function patients. Interval that is too short can cause the accumulation of antibiotic in the body.

Table 5: Cross tabulation of data analysis the relationship between the level of use of the cephalosporin class antibiotic sensitivity of bacteria to antibiotics with cephalosporin class

Level of use	Cephalosporin antibiotics	Sensitivity			df	p value
		R	I	S		
Low	ceftazidime	2	-	-	2	0,701
High	Ceftriaxone	8	2	1		

Graph of correlation between the use of cephalosporin class antibiotic sensitivity of bacteria to antibiotics with cephalosporin class



From the results of chi square test P value of 0.701 obtained greater than 0.05, which means that the hypothesis H1 is accepted or really any relationship between the level of use of the cephalosporin class antibiotic sensitivity of bacteria to antibiotics with cephalosporin class.

Conclusion:

The use of cephalosporin class of antibiotics in the ICU General Hospital Center in the period from August to October 2009 which is high enough to affect the occurrence of bacterial resistance. This is due to the high use of antibiotics in a place within a certain period of time can lead to resistance of germs and reduce the sensitivity of these antibiotics.

In this case, the level is high the use of ceftriaxone may increase the resistance of germs to ceftriaxone. Can be predicted if the user continues to increase, so in the coming months, the sensitivity will be reduced ceftriaxone. The existence of significant correlation between the level of use of the cephalosporin class antibiotic sensitivity of bacteria to antibiotics with cephalosporin class.

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