



Study of Drug Related Problems (DRPs) In Stroke Patients at Regional General Hospital Cilacap

Wastim¹, DyahPerwitasari¹, Murwiningsih²

¹Faculty of Farmasi Ahmad Dahlan University Yogyakarta, Indonesia.

²Regional General Hospital, Cilacap, Indonesia.

ABSTRACT

Stroke is the leading cause of death worldwide. Comprehensive clinical pharmacy services can reduce the incidence of DRPs in stroke patients. This study aims to find out the Drug Related Problems (DRPs) and related factors to the incidence of DRPs in hospitalized stroke patients in RSUD Cilacap in 2017. This study used retrospective cohort design with PCNE v8.01 2017 instrument we collected 313 patients' medical records, most of them were ≥ 60 years old and 46.3% of them were < 60 years. The cases of DRPs where there are drugs with no indication are 312 cases; 311 cases of drug incompatibly with guidelines, 311 cases of drug incompatibly with therapy guidelines; 159 cases where there are indication but no drugs; 120 cases of exceedingly low drugs dosages; 164 cases of overly short treatment duration; 149 cases of overly long treatment duration; and 120 cases where the drugs are wrongly given. The research shows that $p > 0,05$ which means there are no relationship between age and incidence of DRPs, no correlation between number of drugs received during treatment and the incidence of DRPs, and no relationship between LOS patients and the incidence of DRPs.

KEYWORDS: Drug Related Problems, Non Hemorrhagic Stroke, LOS.

Received 17 October, 2021; Revised: 30 October, 2021; Accepted 01 November, 2021 © The author(s) 2021. Published with open access at www.questjournals.org

I. INTRODUCTION

Stroke is a cerebrovascular disease that occurs suddenly due to the cessation of blood supply to the brain due to blockage (ischemic stroke) or bleeding (hemorrhagic stroke). Ischemic stroke occurs because blood flow to the brain is stopped because of atherosclerosis or blood clots that have clogged a blood vessel that will disrupt the supply of oxygen and nutrients to the brain. This disease is increasing every year based on AHA in 2017 (AHA, 2017). The highest stroke prevalence based on the health diagnosis reaches in North Sulawesi which is 10.8%, followed by DIY Yogyakarta 10,3% 9.7, Bangka Belitung and DKI Jakarta 9.7 per miles of each. The highest stroke prevalence based on 92 diagnosed health status and symptoms was in south Sulawesi 17.9%, DI Yogyakarta 16.9%, Central Sulawesi 16.6%, followed by East Java at 16 per mile (Anonim, 2013). The number of stroke patients in 2020 is estimated to be doubled, even Indonesia today is the fourth country in the world with the largest number of stroke patients after India, China, and America (Feigin, 2006). The increasing number of types of therapies used to improve the quality of life-saving patients can also trigger the emergence of things that cannot be denied, namely the possibility of the occurrence of treatment results that are not in line with expectations. This mismatch can be due to the emergence of Drug Related Problems (DRPs) with PCNE V8.01 2017. Classifications of DRPs studied are drug selection, dose selection, duration of treatment and drug dispensing (PCNE, 2017).

Based on this background the authors are interested in conducting research to find out and identify the types and number of percentages of DRP events that occur in hospitalized stroke patients at the regional general hospital (RSUD) Cilacap. Objective of the study, this study aims to determine the number of DRPs, determine the relationship of age, number of drugs and length of stay (LOS) to the incidence of DRPs in hospitalized stroke patients in Cilacap Hospital in 2017.

II. METHODS

This study used a retrospective cohort study with instrument PCNE v8 01 2017. The incidence of DRPs examined were drug selection, dose selection, duration of treatment and drug dispensing in hospitalized stroke patients in Cilacap Hospital in 2017 which were recorded in the medical record as many as 313 people.

The data patient taken from medical records are patient identities, name, age, gender, address, level of education, occupation, health insurance, treatment profile, laboratory examination results, LOS, inserted case record form (CRF).

III. RESULTS

General characteristics

The total sample were 313 patients, consisting of 168 (53.7%) ages <60 years, 145 (46.3%) ages ≥60 years, 168 (53.7%) women, 145 (46.3%) male, 142 (45.4%), high school, 300 (95.8%) other jobs, 149 (47.6%) non PBI BPJS, 238 (76%) improved. Data on patient characteristics are presented in table 1.

Table 1. Data on General Characteristics of Stroke Patients in Inpatient RSUDinCilacap2017

Variable	Characteristics	N	%
Old	<60 years	168	53,7
	≥ 60 years	145	46,3
Gender	Male	168	53,7
	Female	145	46,3
Education	Other	14	4,5
	Elementary school	65	20,8
	Junior high school	71	22,7
	High school	142	45,4
	1st level	21	6,7
Jobs	Other	300	95,8
	PNS, ABRI	7	2,2
	Entrepreneur, trader	2	6,0
	Farmers, Laborers, Fishermen	4	1,3
Health Insurance	Public	72	23,0
	Jamkesda	14	4,5
	PBI BPJS	73	23,3
	NON PBI BPJS	149	47,6
	Others	5	1,6
Outcome	Improved	238	76,0
	Died	75	24,0

Characteristics distribution of subjects are male for 168 (53.7%) and female for 145(46.3%). Stroke events in men can be higher than women associated with the hormone testosterone. Increased levels of LDL (Low DensityLipoprotein) are influenced by the hormone testosterone which can affect cholesterol levels in the blood which is a risk factor for degenerative diseases such as stroke (Bull, 2007). At the high school education level 45.4%, Job/occupation 95.8% health insurance BPJS NON PBI 47.6% and outcome improved 76.6%.

The incidence of DRPs in hospitalized stroke patients in RSUD Cilacap obtained in 312 patients 99.7% and 1 patient 0.1% did not experience the incidence of DRPs. Research describes the incidence of DRPs, which are drugs that do not comply with the guidelines 311 cases; drugs that are not in accordance with therapeutic guidelines 311 cases; there are drugs there are no indications 159 cases; there are indications there are no drugs 312 cases; drug doses too high 120 cases; too many drugs prescribed for indications of 110 cases; drug dosage too high 120 cases; drug dosage too high did not occur, duration of treatment too short 164 cases; duration of treatment too long 149 cases; drugs or strength incorrectly given 120 cases.

IV. DISCUSSION

Study of drug related problems

The DRPs study is cases of DRPs where there are drugs with no indication are 312 cases; 311 cases of drug incompatibly with guidelines, 311 cases of drug incompatibly with therapyguidelines; 159 cases where there areindication but no drugs; 120 cases of exceedingly low drugs dosages; 164 cases of overly short treatment duration; 149 cases of overly long treatment duration; and 120 cases where the drugs are wrongly given data on DRPs events are presented in table 2.

Table 2. Number of DRPscases related to causes (including possible causes of potential problems) (PCNE V8.01, 2017)

Primary Domain	code	Problem	N
1. Drug selection The cause of the (potential) DRP is related to the selection of the drug	C1.1	Inappropriate drug according to guidelines /formulary	311
	C1.2	Inappropriate drug (within guidelines but otherwise contra-indicated)	311
		No indication for drug	
	C1.3	Inappropriate combination of drugs or drugs and herbal medication	312
	C1.4	Inappropriate duplication of therapeutic group or active ingredient	No
		No drug treatment in spite of existing indication	

	CI.5	Too many drugs prescribed for indication	No
	C1.6		159
	C1.7		110
2. Dose selection The cause of the DRP is related to the selection of the dose or dosage	C3.1	Drug dose too low	120
	C3.2	Drug dose too high	No
3. Treatment duration The cause of the DRP is related to the duration of treatment	C4.1	Duration of treatment too short	164
	C4.2	Duration of treatment too long	149
4. Dispensing The cause of the DRP is related to the logistics of the prescribing and dispensing process	C5.4	Wrong drug or strength dispensed	120

The incidence of strokes repeated 6 months after the first ischemic stroke between patients who received antiplatelet therapy in combination with aspirin-clopidogrel and antiplatelet aspirin alone was not different (Fatoni et al, 2014). In patients with mild strokes, 21-day treatment with multiple antiplatelet therapy (aspirin and clopidogrel) starting at 24 hours can be useful for the prevention of secondary strokes for periods of up to 90 days from symptom onset (AHA / ASA, 2018). The principle of non-hemorrhagic stroke treatment therapy is to improve blood flow to the brain and increase blood to the brain. Provision of coagulation therapy between neuroprotectors and antiplatelet has been shown to be effective compared to monotherapy. The neuroprotector drug used is piracetam and citicolin which can protect the brain that is experiencing ischemia (Praja, 2013).

There are 311 cases where the drug do not appropriate with guidelines 311 cases of inappropriate drugs in therapy guidelines Problems that often arise from antihypertensive drugs are indicated in patients with unreacted stroke thrombolytic therapy where systolic blood pressure ≥ 220 mmHg or diastolic pressure 120 mmHg (AHA / ASA, 2018). The appropriate antihypertension therapies are labetalol, nicardipine, clevidipin or other intravenous hydralazine and enalaprilate. Whereas other literature for hypertension in stroke drugs, the main choice is the ACE-inhibitor group (Dipiro, 2006). Cases of hypertension in stroke that fall into the category of ≥ 60 years, the selection of the right drug is a group of calcium channel blockers such as amlodipine (Katzung, 2004). In addition, the administration of anticonvulsants, namely the benzodiazepine group, became a case that arose in inappropriate drug selection (Perdosi, 2011). In addition to the emergence of neuroprotector (piracetam and citicolin), prophylactic antibiotics aimed at reducing the risk of infection in ischemic stroke cases have not been shown to be beneficial (AHA/ASA, 2018). In addition to giving corticosteroids to stroke patients it is not recommended to treat brain edema and high intracranial pressure in ischemic stroke (Perdosi, 2011).

Cases related with indication existence, no drug are about 159 cases occurring in antiplatelet administration. Antiplatelet administration is recommended in ischemic stroke patients (PERDOSI, 2011). Too many drugs are prescribed for indications that the patient has complications of the disease, improper administration of the drug.

Selection of dosage is too low dose 120 events. Exhaustion of the dosage is less on the dose of aspirin. Less dosage means it may not reach the therapeutic window so that it does not cause a therapeutic effect (does not reach Minimum Effective Concentration) (Priyanto, 2009). Giving aspirin 160mg-300mg (AHA, 2018)

The case of duration of treatment, Literature. Problems with the duration of treatment are influenced by age (Okere, et al, 2015).

The case of dispensing is wrong drugs or strength dispensed 120 cases. Problems that appear on the drug or the wrong strength of antiplatelet administration. Giving aspirin 160 mg-300mg in a stroke <24 hours after administration of alteplase intravenous (IV) can reduce the risk of bleeding (AHA, 2018).

The relationship of age to the incidence of DRPs, the number of drugs with the incidence of DRPs and LOS with the incidence of DRPs are presented in table 3.

Table 3. Relationship of patient age, number of drugs, LOS inpatient stroke patients at RSUD Cilacap in 2017 with the incidence of DRPs

Age	DRPs		P	OR	CI
	<3	≥ 3			
<60 years	3 (2,1%)	142 (97,9%)	1,00	1.154	0,254-5,245
≥ 60 years	4 (2,4%)	164 (97,6%)			
Number of drugs					
<7 drugs	5 (2,9%)	170 (97,1%)	0,471	2,000	0,382-10,007
≥ 7 drugs	2 (1,4%)	136 (98,6%)			

LOS					
≤ 5 days	5 (2,9%)	166 (97,1%)	0,462	2,108	0,403-11,036
> 5 days	2 (1,4%)	140 (98,6%)			

The results of the study showed that in patients ≥ 60 years of age there were more frequent occurrences of DRPs compared to patients < 60 years. After chi-square analysis showed that there was no relationship between age and the incidence of DRPs ($p = 1.00$), there was no correlation between the number of drugs received and the incidence of DRPs ($p = 0.471$) and there was no relationship between LOS patients and DRPs ($p = 0.462$).

V. CONCLUSION

The conclusions in the study show that DRPs often occur with drugs, the cases of DRPs where there are drugs with no indication are 312 cases; 311 cases of drug incompatibly with guidelines, 311 cases of drug incompatibly with therapy guidelines; 159 cases where there are indication but no drugs; 120 cases of exceedingly low drugs dosages; 164 cases of overly short treatment duration; 149 cases of overly long treatment duration; and 120 cases where the drugs are wrongly given. The research shows that $p > 0,05$ which means there are no relationship between age and incidence of DRPs, no correlation between number of drugs received during treatment and the incidence of DRPS, and no relationship between LOS patients and the incidence of DRPs.

ACKNOWLEDGMENT

We also want to thank the Cilacap Hospital for doing research specifically to Murwiningsih. S.Si., M.Sc., Apt and commenting on the previous version.

REFERENCES

- [1]. Litbang. Riset Kesehatan Dasar. 2013;
- [2]. Heart Disease and Stroke Statistics, The views expressed in this document are those of the authors and do not necessarily represent the views of the National Heart, Lung, and Blood Institute; the National Institutes of Health; the US Department of Health and Human Services; or the US Department of Veterans Affairs, a report from the American Heart Association. 2017;
- [3]. Classification for Drug Related Problems (revised 15-06-2017vm) v8.01 2003-2017 Pharmaceutical Care Network Europe Foundation. 2017;
- [4]. Panduan Praktek Klinik Stroke Iskemik Rumah Sakit Umum Daerah Cilacap. 2018.
- [5]. Guidelines for the Early Management of Patients With Acute Ischemic Stroke, A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association, Reviewed for evidence-based integrity and endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons, Endorsed by the Society for Academic Emergency Medicine and Neurocritical Care Society, The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. 2018;
- [6]. Bull, E., Simple Giud: 1-10, Kolesterol, Erlangga. 2007;
- [7]. DiPiro, Joseph. T., Talbert, Robert L., Yee, Gary., Matzke, Gary R., Wells, Barbara G., Posey, L., Michael, Pharmacotherapy A Pathophysiologic Approach, 452,456-459, Mc-Graw Hill, New York. 2005;
- [8]. Fatoni, R., Gofir, A., Sugiyanto., Perbandingan Manfaat Antiplatelet Kombinasi Aspirin dan Klopido dengan Aspirin Tunggal pada Stroke Iskemik, Fakultas Farmasi Universitas Gajah Mada. 2014;
- [9]. Feigin, V., Stroke, PT Bhuana Ilmu Populer, Jakarta. Hal 2-15, 2006;
- [10]. Katzung, G. B., 2004, Farmakologi Dasar dan Klinik 3, Edisi 8, Penerbit Salemba Medika, Jakarta. 2004;
- [11]. Khusna, R.H., Evaluasi Ketepatan Obat Dan Dosis Serta Interaksi Obat Antihipertensi pada Pasien Stroke Iskemik Akut di Instalasi Rawat Inap RSUD Kabupaten Batang Periode 2016, Fakultas Farmasi Universitas Muhammadiyah Surakarta, Skripsi. 2018;
- [12]. Lestari, D., 2017, Identifikasi Interaksi Obat Antihipertensi-Obat lain: efek Interaksi Obat Terhadap Tercapainya Target Tekanan Darah Pada Pasien Stroke Iskemik, Universitas Hasanudin Makassar, Tesis. 2017;
- [13]. PERDOSSI, Stroke Guidline, Jakarta: Perhimpinan Dokter Spesialis Syaraf Indonesia. 2011;
- [14]. Praja, D. S., Hasmono, D., Syifa, N., Studi Penggunaan Obat Neuroprotektor Pada Pasien Stroke Iskemik Di Rumah Sakit Umum Dr Saiful Anwar Malang, Program Studi Farmasi Ilmu Kesehatan Universitas Muhammadiyah Malang. Skripsi. 2013;
- [15]. Priyanto, Farmakologi dan Terminologi Medis, Lembaga Studi dan Konsultasi Farmakologi, Jawa Barat. 2009;