

Drug-related problems in stroke patients at RSUPN Dr. Cipto Mangunkusumo Hospital

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ABSTRACT

Introduction: Drug-related problems may influence the therapeutic results in stroke patients during the treatment, and they can lead to failure in achieving the therapeutic objectives. **Methods:** The study was conducted to identify drug-related problems and their percentage, to find the relationship between drug-related problems with the drug types, comorbidity, and duration of hospital stay, and to recommend some solutions for the drug-related problems. The study used descriptive design to analyze samples that met the inclusion criteria. The data were collected from medical records and interviews with the physicians, pharmacists, and nurses. **Results:** Drug-related problems identified in this study were 54.0% due to drug interaction, 33.1% due to too high dosage, 7.3% due to unnecessary drugs, 1.6% due to too low dosage, 1.6% due to the need for additional therapy, 1.6% due to unmet drugs, and 0.8% due to wrong drug therapy. Analysis, which was done using Chi-square, found a relationship between the drug types and drug-related problems, no relationship between comorbidity in stroke patients and drug-related problems, and no relationship between the duration of hospital stay and the drug-related problems. **Conclusions:** The most common recommendation from the pharmacists to the health professionals was a modification in the interval/frequency/timing.

KEYWORDS: Comorbidity, Drug types, Drug-related problems, Duration of hospital stay, Recommendations, Stroke patients

INTRODUCTION

The main objective of any therapy is certainly to improve the patients' quality of life by eliminating the symptoms, reducing morbidity, and treating the diseases. In fact, there are always inevitable things during the treatment process, including the drug-related problems.^[1] Such problems may happen during the treatment process, the pharmacist plays a crucial role in identifying drug-related problems, solving the actual problems, and preventing the potential drug-related problems.^[2]

Stroke is a cerebrovascular disorder. The cases detected tend to increase every year, and it remains an influential health problem.^[3] Stroke leads to complex problems from health, social, and economic aspects. It requires comprehensive management and lengthy treatment period, which may even involve a lifetime process.^[4]

The study conducted by Celin *et al.* (2012) found that stroke patients had an increased risk for developing drug-related problems. They are related to some aspects, including age, as most of the stroke patients are elderly, comorbidity, and polypharmaceutical problems.^[5] Therefore, the pharmacist plays an important role in identifying and preventing the drug-related problems and finding the factors behind them, including drug types, comorbidity, and treatment period, and finally, determining the relationship between the factors with the patients' quality of life.^[1,6]

Based on the background above, the writer is interested in studying the drug-related problems in stroke patients that stayed at RSUPN Dr. Cipto Mangunkusumo Hospital. Recommendations from the study are expected to help in preventing and reducing the drug-related problems in the stroke patients who stayed at RSUPN Dr. CiptoMangunkusumo Hospital.

METHODS

The study was conducted at the Integrated Care Unit, Building A, RSUPN Dr. Cipto Mangunkusumo Hospital in the period of April–June 2014, by means of

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descriptive analytic design and prospective sampling technique using medical records of the patients. The data not available on the medical records were taken from the nurse's note, drug administration register at the pharmaceutical unit, laboratory data, and interviews with the physicians, the pharmacists, and the nurses.

Inclusion Criteria

The following criteria were included in the study:

- Stroke patients who stayed at the Integrated Care Unit of RSUPN Dr. CiptoMangunkusumo Hospital in April–June 2014.
- Ischemic or hemorrhagic stroke patients.
- Stroke patients with or without comorbidity.
- Patients who had complete medical records.

Exclusion Criteria

Patients not included in the study were those who stayed for fewer than 24 h at the hospital.

Data Analysis

Data that had been collected were analyzed using the basic steps, namely, tabulation of demographic data and then presented in a descriptive way, including gender, age, type of stroke, type of drug, comorbidity, and duration of hospital stay. After studying the treatment aspect, the researcher presented the data in a descriptive way, including drug-related problems, which were categorized according to the criteria proposed by Cipolle. Data analysis was conducted to find the relationship between the identified drug-related problems with comorbidity and duration of hospital stay. Additional data used in the study included pharmacist's recommendation to the health professionals. The additional data were presented based on the type and the results of recommendation.

RESULTS AND DISCUSSION

Samples of the study were 86 stroke patients who stayed at the Integrated Care Unit, Building A, RSUPN Dr. Cipto Mangunkusumo Hospital during the period of April–June 2014, as presented in the demographic data in Table 1.

The study found that male population was more dominant than female population. This is in line with the study conducted by Celin, who also found domination of male population over female population. Based on age category, the study found that most patients aged between 51 and 60 years, with a mean age of 58 years. Stroke can actually happen to anyone, even the young and productive individual, depending on the risk factors, such as smoking habit, alcohol consumption, unhealthy eating pattern, lack of physical activity, and stress. The study found that of the 86 patients, 64 (74.4%) had ischemic stroke and 22 patients (24.6%) had

hemorrhagic stroke. This confirmed the study conducted by Celin, on which ischemic stroke population was more dominant than hemorrhagic population. Based on the drug type category, most patients received 5–10 types of drug during the stay at RSUPN Dr. Cipto Mangunkusumo Hospital. Most patients were found to have one comorbidity. The dominant comorbidity was hypertension. Based on the data presented in Table 1, the stroke patients, both ischemic and hemorrhagic, mostly stayed at the hospital for 2–10 days. The study conducted by Celin *et al.* (2012) found that stroke patients mostly stayed at the hospital for more than 6 days. Duration of hospital stay has something to do with the time necessary for post-stroke recovery. The patients should have enough time for restoring the damaged tissues after the stroke. The more serious the tissue damage is, the longer it takes for recovery, and vice versa.

Drug-related Problems

The study conducted at the Integrated Care Unit of RSUPN Dr. Cipto Mangunkusumo Hospital found that of the 86 patients identified, 76 patients had drug-related problems (5.6% were actual problems and 94.4% were potential problems). Meanwhile, 10 patients did not have drug-related problems.

The drug-related problems were categorized based on the classification proposed by Cipolle, and the results of the study are presented in Table 1.

Drug-related problems found in the study were drug interaction (54.0%), too-high drug dosage (33.1%),

Table 1. Demographic data of stroke patient

Characteristics	n = 86 (%)
Gender	
Male	57 (66.3)
Female	29 (33.7)
Age (year)	
<50	20 (23.3)
51–60	33 (38.4)
61–70	19 (22.1)
>70	14 (16.3)
Type of stroke	
Ischemic stroke	64 (74.4)
Hemorrhagic stroke	22 (25.6)
Type of drug	
<5	2 (2.3)
5–10	37 (43)
11–15	29 (33.7)
16–20	17 (19.8)
>20	1 (1.2)
Comorbidity number	
0	5 (5.9)
1	30 (34.9)
2	28 (32.5)
3	13 (15.1)
4	8 (9.3)
5	2 (2.3)
Duration of hospital (day)	
2–10	47 (54.7)
11–20	31 (36)
21–30	8 (9.3)

unnecessary therapy (7.3%), too-low drug dosage (1.6%), the need for additional therapy (1.6%), failure to get the necessary drugs (1.6%), and drug mistake therapy (0.8%) [Figure 1].

According to the study, drug interaction was the most common drug-related problem. The most commonly identified drug interaction during the study was an interaction between simvastatin and amlodipine. When both drugs were administered simultaneously, the concentration of simvastatin in the blood would increase. The use of simvastatin simultaneously with amlodipine could increase the plasma simvastatin and its active metabolite (simvastatin acid) in a significant way. The drug interaction might also lead to the risk of statin-induced myopathies. The general procedure of drug interaction management includes monitoring the patients' condition to see the signs or symptoms of myositis and rhabdomyolysis. In addition, the recommended dosage of simvastatin is no more than 20 mg, when administered simultaneously with amlodipine.

Another drug-related problem identified in the study was too high dosage, particularly when it comes to the use of laxadine. In the study, laxadine was administered 3 times a day, each dose consisting of 3 spoons (15 ml). The general recommendation of laxadine is single dose a day (1–2 spoon or 15 ml), taken before bed. Laxadine is a laxative and indicated so. High dosage may lead to adversary effects.

Lengthy use of the laxative may lead to weight reduction, muscular weakness, liquid, and electrolyte loss. In this case, the patients had potential drug-related problems, since no excessive defecation effects were identified.

Unnecessary therapy, or therapy without indication, was the use of unnecessary drug or use of drugs that did not fit the medical condition of the patients. The study found 7.3% cases related to unnecessary therapy. They included patients who received piracetam and cytocholin. Effective use of both drugs in clinical tests as neuroprotectors has not been identified so far for the stroke patients.

The study found 1.6% drug-related problems because of too low dosage, namely, the patients received a single dosage of 500 mg paracetamol a day. In this case, the dosing frequency was not appropriate. The general recommendation of paracetamol is 325–650 mg a day, administered every 4–6 h, or 1000 mg a day, administered 3–4 times a day.

Drug-related problems related to the need for additional therapy were found in the patients who had new medical problems and required preliminary therapy, patients who had chronic medical condition

and required sustainable drug therapy, patients who had a health condition that required combined therapy to reach synergic and potential effects, and patients who were developing new health condition that could be prevented using preventive drug and paramedical intervention. Overall, 1.6% of the drug-related problems were found in the patients who required additional therapy.

Other drug-related problems identified in the study were a failure to get the necessary drugs (1.6%) since the drugs were not available and wrong drug therapy (0.8%), in which the patients received drugs that were not suitable with the patients' medical condition.

Relationship between Drug-related Problems and Drug Types, Comorbidity, and Duration of Hospital Stay

A statistical analysis using Chi-square test found a correlation between drug-related problems and the types of drug received by the patients, no correlation between the number of comorbidities and the drug-related problems, and no correlation between the duration of hospital stay and the drug-related problems.

Recommendation

For additional data, the researcher presents recommendations from the pharmacist to the health professionals on the identified drug-related

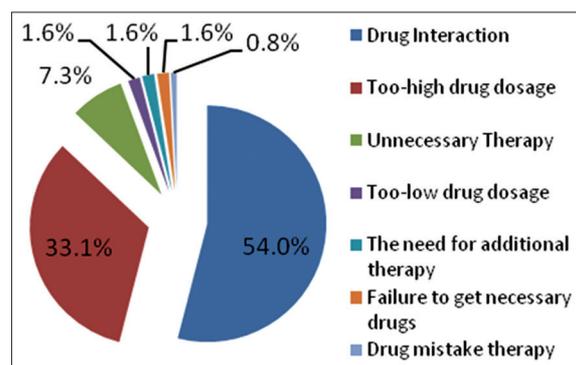


Figure 1: Category of stroke patients based on the classification of drug-related problems

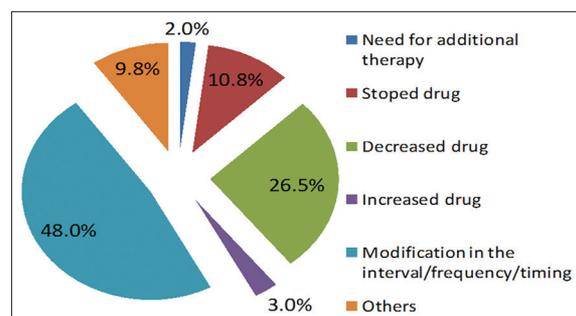


Figure 2: Category of recommendation based on drug-related problems

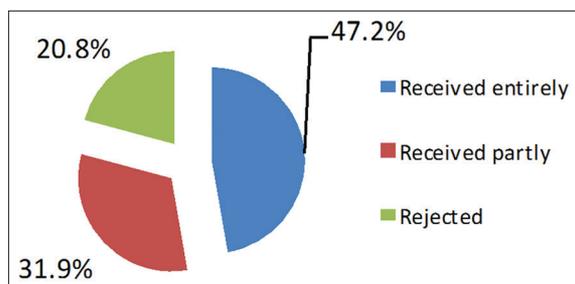


Figure 3: Results of recommendation on drug-related problems

problems. The recommendations are presented in Figures 2 and 3.

The most common recommendation from the pharmacist was modification of interval/frequency/time (48.0%) of drug administration because of the problems related to drug interaction. Then, the recommendation was used as a recommendation for using or not using the drug based on the clinical conditions of the patients. The study concluded that the medical professionals (physician and nurses) mostly received the pharmacist's recommendation. Level of recommendation acceptance was 47.2%.

CONCLUSION

The study concludes that of 86 stroke patients, 76 patients were identified to have drug-related problems, both actual and potential problems, while 10 patients did not have drug-related problems. The types of drug-related problems in the stroke patients who stayed at the Integrated Care Unit, Building A, RSUPN Dr. Cipto Mangunkusumo Hospital, are drug interaction (54.0%), too high dosage (33.1%), unnecessary drug therapy (7.3%), too low dosage (1.6%), the need for additional therapy (1.6%), failure to get the necessary drugs (1.6%), and wrong therapy (0.8%).

A statistical analysis using Chi-square test concludes that there is a correlation between the number of drug types and the drug-related problems, there is no correlation between the number of comorbidity and the drug-related problems, and there is no correlation between the duration of hospital stay and the drug-related problems. The most common recommendations from the pharmacists to the health professionals were a modification of interval/frequency/time of drug administration, with an overall acceptance level of 47.2%.

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