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Identification of Potential Inappropriate Prescribing (PIP) for the Geriatric Patients used *Beers* Criteria in IbnuSina Hospital Makassar Indonesia

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ABSTRACT

A research has been done to identifying the inappropriate use of drugs for the geriatric patients used Beers Criteria in IbnuSina Hospital Makassar. This research aims to evaluate the prevalence of PIP to the geriatric patients in IbnuSina Hospital Makassar. The PIP was evaluated by the Beers criteria. This research uses a descriptive study using the medical records of the patients with method of taking samples retrospectively from September 2014 to November 2014 . The selection of this research subjects by the purposive sampling. The results of this research concluded that according to Beers Criteria, the prevalence of PIP among geriatric patient at IbnuSina Hospital Makassar in Indonesia was 87,1%. The most three of group medicines detected by Beers criteria involve insulin (54,33%), NSAID (20,47%), and Benzodiazepines (14,96%).

Key words:*Beers* Criteria, geriatrics, Polypharmacy, PIP

INTRODUCTION

The current demographic changes, generally characterized by a dramatic improvement in life expectancy and resulting increase in population rates aging is, among other things, showing new health needs, among which include high frequency of comorbidities and using associated polypharmacy[1].Polypharmacy is common among the elderly. Many studies have found that various numbers of medications are associated with negative health outcomes. Using multiple medications may cause problems such as the increased risk of use of medications, nonadherence, and adverse effect. Health care professional should be aware of the risk and fully evaluate all medications at each patients visit to prevent polypharmacy from occurring[2].

Pharmacokinetics and pharmacodynamics changes in older people are of much relevance in dose regiment. Lack of awareness of these change can contribute to inappropriate medicines use, which can cause adverse drug effect. A potentially inappropriate prescriptions (PIP) is assumed when the risk of adverse effect outweighs the expected clinical benefit, especially when a safer and more effective alternative therapy is available for the same conditions[3].Suboptimal or inappropriate prescribing has been linked to excess morbidity and hospitalization [4]. Criteria that were initially developed for defining inappropriate prescribing in frail elderly nursing home resident have been adapted for used in community-dwelling elderly[5,6].

Appropriate prescribing can be assessed by explicit indicators developed by consensus approaches. The most commonly used explicit criteria to review drug treatments and to identify PIP are the Beers criteria. This tool include a list of inappropriate drug that should be avoided in older patients because of toxicity relating to the agent, too-frequent dose or too-large accumulative daily doses (independent of diagnosis), plus a list of criteria considering diagnoses with possible drug-disease interactions[7].Beers criteria have been most widely used to estimate

prescription of potentially inappropriate medication for nursing home residents, hospital inpatients, and the community-dwelling elderly in the United States, Canada and European countries[8].

The prevalence and risk factors of potentially inappropriate medication use among the elderly patients have been studied in various countries. In Developed countries, the demographic trends moves towards a society with population with increasing percentages of citizens aged 65 years and more[2].

This highlight the need for regular reviews and adjustment of the treatment taken by this population. By means of a pharmaceutical care service, pharmacist can help detect potential medication problems and improve medication selection appropriateness in older people [9].

MATERIALS AND METHODS

Population in this research are geriatric patient prescription. The samples were the prescription data from medical record of 70 geriatric patients who hospitalized at IbnuSina Hospital in Makassar period of September 2014 to November 2014. The research has done descriptively with retrospective tracing the improper use of drugs by the *Beers* Criteria. The selection of research subjects by purposive sampling that samples taken adapted to the purpose of the study and met the study criteria.

RESULTS AND DISCUSSION

Table 1 summarizes the characteristics of the 70 patients prescribed at least one regular systematically acting medicines in IbnuSina Hospital Makassar. According to demographic patiens, 64.3% were female and the majority 91.4% were in range 60-74 years of age. Most of patients suffer endocrine disorder (74.3%) with variation length of stay.

Table 1. Characteristics of geriatric patients in IbnuSina Hospital Makassar

Characteristics	Total	
	n=70	(%)
Sex		
Male	25	35,7
Female	45	64,3
Age(years old)		
60-74	64	91,4
75-90	6	8,6
Diagnosed Disease		
Cardiovascular	10	14,3
Endocrine	52	74,3
Other	8	11,5
Length of Stay (day)		
1-5	40	57,1
6-10	18	25,7
> 10	12	17,2
Total	**70**	**100**

Table 2 summarizes some group of medicines as potential inappropriate prescription (PIP) which found from sample at the research period according to *Beers* criteria.

Table 2.The using of drugs according to *Beers*criteria of geriatric patients inIbnu Sina Hospital Makassar

Criteria	Group of Medicines	PIP (n)	%
Beers	Insulin	69	54,33
	NSAID	26	20,47
	Benzodiazepines	19	14,96
	Metochlopramide	6	4,72
	Niphedipine	3	2,36
	Antagonist-α	2	1,4
	Antispasmodic	1	0,79
	Antidepressant tricyclic	1	0,79
TOTAL		**127**	**100**

Total number PIP that is found for 70 sample of geriatric patient according to table 2 was 127 PIP from 61 sample of geriatric patient. Almost 90% of the PIP detected by *Beers* criteria involve insulin, NSAID, and Benzodiazepines. According to *Beers* criteria, independently of diagnosis, the most frequently inappropriate drugs use was insulin (54,33%). Insulin still used because of patient needed. So that insulin always monitored to minimize hypoglycemic

incident. NSAID was the second top PIP found (20,47%)was NSAID. The *Beers* criteria considered that were to be avoided with gastric or duodenal ulcers [10].

Benzodiazepines was the three top PIP was benzodiazepine (14,96%). Benzodiazepines for geriatric patient have negative effect. Long acting benzodiazepines have been frequently highlighted as inappropriate, particularly concerning the risk of fall and fractures and their contribution to mental deterioration[11,12].Chronic used of benzodiazepines has been described in more than 30% of Spanish geriatric patient[13], and long acting benzodiazepines are prescribed more than short-acting benzodiazepines among Spanish retired people[14]. Benzodiazepine with t1/2 shorter as alprazolam with no active metabolite can be choose if it need to prescribing[15]. Discontinuing of benzodiazepines or substituting them with medication not increasing the risk of falls may help to prevent these accident and reduce the medical expenditure[16]. Long acting benzodiazepines, and the simultaneous administration of two psychotropic drug from the same therapeutic class, were frequently involved in patient with adverse drug reaction admitted to a geriatric hospital[17].Benzodiazepine use in geriatric patients was also the one of the most common potential problems identified in many studies[18,19,20,21]

Table 3summarises the PIP distribution per patients. The *Beers* Criteria detect the number of patients with one or more PIP (28,6% had one inappropriate, 27,1% had two inappropriate, 22,9% had three inappropriate, 5,7% had four inappropriate, and 2,9% had five inappropriate). Thus, a total of 87,1% (61 patients) of the 70 patients had any PIP according to the *Beers* criteria.

Table 3. Number of geriatric patients identified with a potential inappropriate prescription (PIP) according to *Beers* Criteria in IbnuSina Hospital Makassar

PIP	*Patients*	
	n=70	**%**
1 inappropriate	20	28,6
2 innapropriate	19	27,1
3 innapropriate	16	22,9
4 innapropriate	4	5,7
5 innapropriate	2	2,9
Total	***61***	***87,1***

PIP is an important health care issue in the geriatric population, with deserves attention. In this study, we found that the prevalence of PIP was 87,1%. To our knowledge, this is the first study evaluating PIP by using *Beers* Criteria at Makassar City in Indonesia. The result of this study is significant if we compare with previous report in Europe, the prevalence PIP was 35% as similar as Taiwan was 36,2% [22]. So that the result is important to improve quality of prescribing for geriatric patient.

CONCLUTION

By using *Beers* Criteria, the prevalence of PIP among geriatric patient at IbnuSina Hospital Makassar in Indonesia was 87,1%. The most three of group medicines detected by *Beers* criteria involve insulin (54,33%), NSAID (20,47%), and Benzodiazepines (14,96%).

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