FACULTY OF PHARMACY AND SCIENCE
UNIVERSITAS MUHAMMADIYAH PROF. DR. HAMKA

With high appreciation presents

Certificate

to

Numlil Khaira Rusdi

For her/his attendance as **Oral Presenter**
in the

Muhammadiyah International Conference on Health and Pharmaceutical Development (MICH-PhD)

"Current Innovation in Chronic Diseases Treatment"

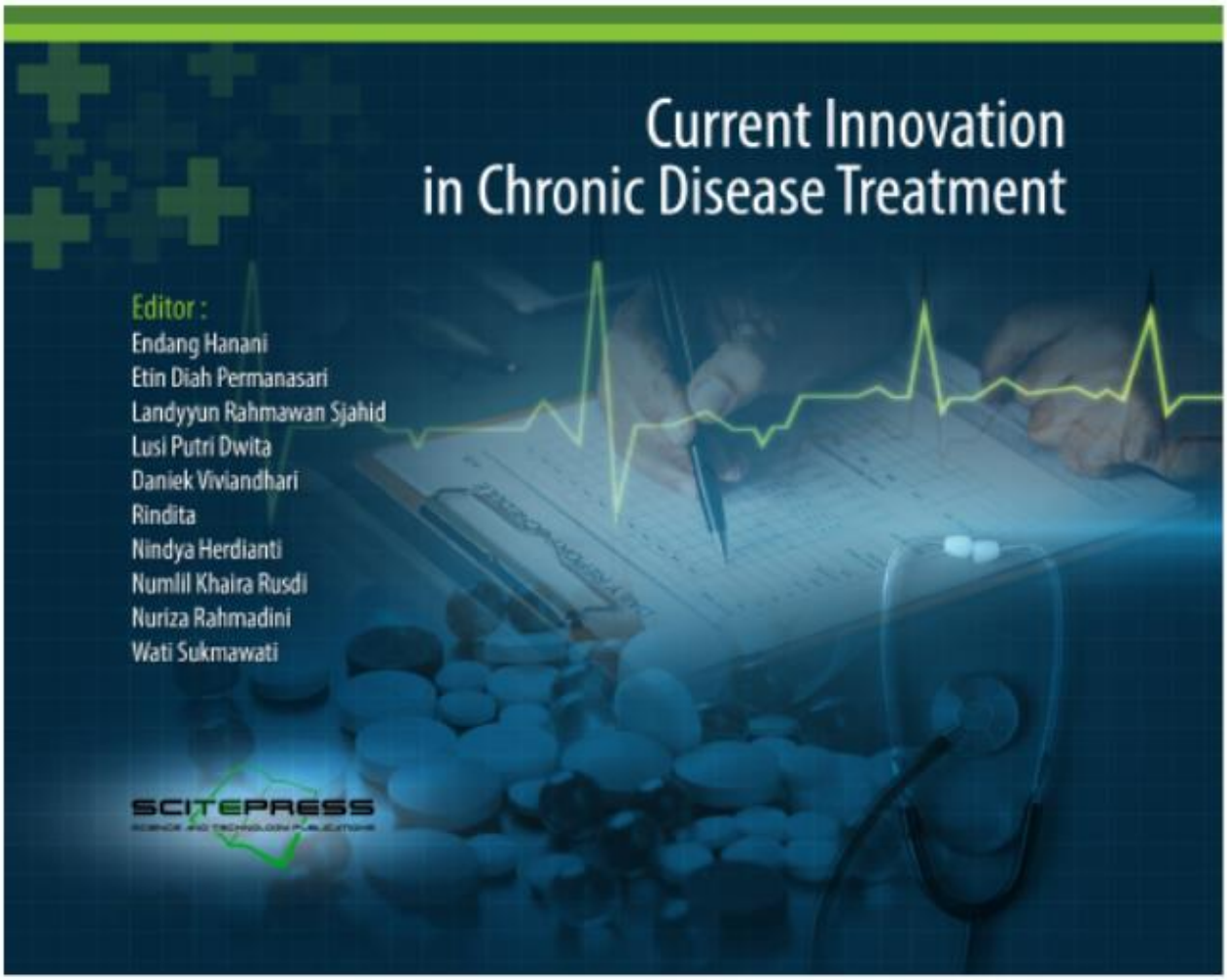
With SKP **IAI as Oral Presenter: 3 SKP** number: 263/SK-SKP/PP.IAI/IV/2018

Dr. Hadi Sunaryo, M.Si., Apt.
Dean of Faculty of Pharmacy and Science - UHAMKA

Jakarta, August 10th – 11th, 2018

Nurhasnah, M.Farm., Apt.
Chairman of Organization Committee

Proceedings of
FIRST MUHAMMADIYAH INTERNATIONAL CONFERENCE on HEALTH and PHARMACEUTICAL DEVELOPMENT (MICH-PhD) 2018



Proceedings

Proceedings of the 1st Muhammadiyah International Conference on Health and Pharmaceutical Development

August 10-11, 2018, in East Jakarta, Indonesia

Editors: Endang Hanani ; Etin Diah Permanasari ; Landyyun Rahmawan Sjahid ; Lusi Putri Dwita ; Daniek Viviandhari ; Rindita ; Nindya Herdianti ; Numlil Khaira Rusdi ; Nuriza Rahmadini and Wati Sukmawati

Affiliation: Universitas Muhammadiyah Prof. DR. HAMKA, Indonesia

ISBN: 978-989-758-349-0

Conference Link: http://michphd.uhamka.ac.id

Foreword: This book contains the proceedings of the first Muhammadiyah International Conference on Health and Pharmaceutical Development (MICH-PhD). MICH-PhD was held on 10-11 Augustus 2018 in Jakarta, Indonesia. The conference organized by Faculty of Pharmacy and Science, Universitas Muhammadiyah Prof. DR. HAMKA (UHAMKA) in collaboration with Association of Muhammadiyah Pharmacy Higher Education (Universitas Muhammadiyah Surakarta, Universitas Ahmad Dahlan, Universitas Muhammadiyah Malang, Universitas Muhammadiyah Banjarmasin, Universitas Muhammadiyah Purwokerto, Universitas Muhammadiyah Yogyakarta, Sekolah Tinggi Farmasi Muhammadiyah Tangerang, Sekolah Tinggi Farmasi Muhammadiyah Cirebon, STIKES Muhammadiyah Pekajangan, STIKES

Muhammadiyah Gombong and Universitas Muhammadiyah Magelang). The aim of this conference is to provide opportunities for participants to present their research and to expose participants to the development and innovation made in the field **(More)**

Volumes:

Vol. 1 - 978-989-758-349-0

Papers | Authors

Show 50 papers

The Impact of Short Message Service (SMS) Reminder and Home Monitoring on Blood Pressure Control in Hypertension Patients: A Case Study of Two Primary Health Care Facilities in Banyumas Regency P. 5 - 10
Laksmi Maharani , Hening Pratiwi and Ika Mustikaningtias **DOI:**10.5220/000823840

Effect of Acute Administration of Eel (Anguilla bicolor bicolor) Oil to Hematological Parameters in Mice P. 11 - 14
Heru Sasongko **DOI:**10.5220/000823850

The Preservation of Liposomes During Air Drying Using a Matrix Containing Maltodextrin and HPMC P. 15 - 18
Raditya Weka Nugraheni , Helmy Yusuf and Dwi Setyawan **DOI:**10.5220/000823860

Molecular Docking Study of Lemon (Citrus limon (Linn) Burm. f) Flavonoid Derivatives Compound in Receptor Cyclooxygenase-1 (COX-1) as Antiplatelet in Ischaemic Stroke Disease P. 19 - 25
Rizky Arcinthya Rachmania , Hariyanti and Nurul Rochmah **DOI:**10.5220/000823870

Post-therapeutic Response Evaluation of Patients Receiving Percutaneous Coronary Intervention at the Regional Hospital in Bantul, Yogyakarta P. 26 - 32
Pramitha Esha Nirmala Dewi **DOI:**10.5220/000823880

Evaluation of CA 125, BUN, and Creatinine Serum in Ovarian Cancer Patients Receiving Paclitaxel-Cisplatin Chemotherapy Treatment P. 33 - 38
Rini Noviyani , P. A. Indrayathi , I. N. G. Budiana , Rasmaya Niruri , K. Tunas and Tamara Candra Paramitha **DOI:**10.5220/000823890

The Effect of Increased Level of Avocado (Persea americana Mill.) Seed Starch as Binding Agent on Physical Properties of the Liquorice Extract (Glycyrrhiza glabra Linn.) Lozenges P. 39 - 43
Landyyun Rahmawan Sjahid , Anneke Lionie Kumala Satki and Inding Gusmayadi **DOI:**10.5220/000823900

The Antioxidant Activity Analysis of the Ethanolic Extract of Banana Peel (Musa paradisiaca forma typica) with DPPH Method P. 44 - 47
Novia Ariani and Laela Hayu Nurani **DOI:**10.5220/000823910

Empirical Antibiotics Study on Pneumonia in Intensive Care Unit P. 48 - 53
Yeni Farida , Katarina Puspita and Zahra Yusvida **DOI:**10.5220/000823920

Formulation of Sechium edule Extract Effervescent Granule with the Variation of Citric Acid, Tartrate Acid and Sodium Bicarbonate P. 54 - 60
Ina Ba'dia Grajang and Iis Wahyuningsih **DOI:**10.5220/000823930

Anti-Hyperlipidemic Effect of 70% Ethanol Extract from Mesona palustris Blume Leaves on Male Hamsters P. 61 - 65
Dwitiyanti , Ni Putu Ermi Hikmawanti , Kriana Efendi , Riana Puspa Dewi and Fernita Afriyani **DOI:**10.5220/000823940

Hepatoprotective Effect of Mountain Papaya (Vasconcellea pubescens A.DC.) Fruit Extract against Acetaminophen-Induced Acute Liver Damage P. 66 - 70
Heru Sasongko , Diah Pratiwi , Trias Amartiwi , Nur Rohman Efendi and Sugiyarto **DOI:**10.5220/000823950

Public Counseling: An Educational Model to Improve Medication Adherence in Type 2 Diabetes Mellitus Patients P. 71 - 76
Daniek Viviandhari , Nora Wulandari and Francyska Putri Puspita **DOI:**10.5220/000823960

The Effects of Liposomale Methylprednisolone Palmitate on the Production of TNFα in Mice P. 77 - 83
Aprilita Rina Yanti Eff , F. D. Suyatna and Erni H. Purwaningsih **DOI:**10.5220/000823970

Potential Risk Factors of End Stage Renal Disease in Patients of Hemodialysis P. 84 - 89
Diana Laila Ramatillah , Syed Azhar Syed Sulaiman , Amer Hayat Khan and Ihsanil Husna **DOI:**10.5220/000823980

Analysis of Eugenol Content in Ethanolic Extract of Galangal Rhizome (Alpinia galanga L. Willd) Ointment Using UV-VIS Spectrophotometry Method P. 90 - 95
Adi Yugatama , Sholichah Rohmani and Rizky Apriliani **DOI:**10.5220/000823990

Steamed Watermelon (Citrullus lanatus Thunb.) Juice Improves Spatial Memory in Dementia Rat Model P. 96 - 101
Maifitrianti , Hadi Sunaryo and Dedi Suryadi **DOI:**10.5220/000824000

Anti-hyperuricemia Effect of Water Fraction Cinnamon (Cinnamomum burmannii (Ness & T. Ness) Blume) on White Male Rats P. 102 - 106
Dwitiyanti , Ema Dewanti and Rizky Arcinthya Rachmania **DOI:**10.5220/000824010

The Alpha-Amylase Inhibition Potential of Endophytic Fungi from Indonesian Bay Leaves (Eugenia polyantha WIGHT.) P. 107 - 111
Wahyu Hidayati , Ade Nur Padillah , Maharadingga , Ni Putu Ermi Hikmawanti , Rini Prastiwi , Ani Pratiwi , Lady Farahmayuni , Rezza Syahputra and Muhammad Fahrul **DOI:**10.5220/000824020

Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta P. 112 - 116
Numlil Khaira Rusdi , Dini Indah Komariah , Nora Wulandari and Arya Govinda Roosheroe **DOI:**10.5220/000824030

Study in Activity Combination of Physalis angulata and Hibiscus sabdariffa in 70% Ethanol Extract to Decrease Blood Sugar Levels and Histopathology of Pancreas Langerhans Island in Alloxan Induced Diabetic Rats P. 117 - 122
Hadi Sunaryo , Ni Putu Ermi Hikmawanti and Hesty Awanis Listyaningrum **DOI:**10.5220/000824040

In Silico Analysis of the Phytochemical Compounds in Carica papaya Seeds for Optimizing the Inhibitors of HMG-CoA Reductase P. 123 - 132
Hariyanti , Rizky Arcinthya Rachmania , Mutia Karinah and Hadi Sunaryo **DOI:**10.5220/000824050

Antihyperglycemic Activity of Ethanolic Herb Extract of Ceplukan (Physalis angulata L.) in Diabetic Hypercholesterolemia in Male Hamsters P. 133 - 137
Elly Wardani , Dwitiyanti , Sediarso and Dwina Puspandiyah **DOI:**10.5220/000824060

Extraction, Identification, and Gel Formulation of Mangiferin from Mango (Mangifera indica L.) Leaves Extract P. 138 - 142
Rudi Afrinanda , Yusa Ristiawati , Muhammad Shoufi Islami and Deasy Vanda Pertiwi **DOI:**10.5220/000824070

The Potency of Binahong Leaves (Anredera cordifolia (Ten.) Steenis) Subfraction with Ethanol 70% as an Antihyperuricemic Agent P. 143 - 146
Vera Ladeska , Ani Pahriyani and Monika Silviani Gunawijaya **DOI:**10.5220/000824080

The Effect of Concentration Ratio of Gelatine and Polyvinylpyrrolidone as Binders on the Physical Properties of Red Ginger (Zingiber officinale Rosc.) Extract Lozenges P. 147 - 153
Inding Gusmayadi and Priyanto **DOI:**10.5220/000824090

Formulation of Moringa oleifera Leaf Extract in Lotion and Gel as Sunscreen P. 154 - 158
Nining Sugihartini , M. Alif Fajri and Desty Restia Rahmawati **DOI:**10.5220/000824100

Quality Control of Turmeric Rhizome (Curcuma domestica Val) as Traditional Medicine from Wonogiri, Central Java P. 159 - 168
Fatimah Nisma , Ema Dewanti , Rini Prastiwi , Alexander , Wanda Puspita Sari and Wido Artanto **DOI:**10.5220/000824110

Screening of Antibacterial Potency and Molecular Identification of Endophytic Bacteria from Soursop Leaf (Annona muricata L.) P. 169 - 175
Fitri Yuniarti , Wahyu Hidayati and Lulu Shofaya **DOI:**10.5220/000824120

RESOURCES

Proceedings

Papers

Authors

Ontology

CONTACTS

Science and Technology Publications, Lda
Avenida de S. Francisco Xavier, Lote 7 Cv. C,
2900-616 Setúbal, Portugal.

Phone: +351 265 520 185
Fax: +351 265 520 186
Email: info@scitepress.org

EXTERNAL LINKS

PRIMORIS

INSTICC

SCITEVENTS

CROSSREF

PROCEEDINGS SUBMITTED FOR INDEXATION BY:

dblp

Ei Compendex

SCOPUS

Semantic Scholar

Google Scholar

Microsoft Academic

© 2021 SciTePress, Science and Technology Publications, Lda - All rights reserved.

SCITEPRESS - SCIENCE AND TECHNOLOGY PUBLICATIONS, LDA.
DIGITAL LIBRARY

RESOURCES

Proceedings

Papers

Authors

Ontology

CONTACTS

Science and Technology Publications, Lda
Avenida de S. Francisco Xavier, Lote 7 Cv. C,
2900-616 Setúbal, Portugal.

Phone: +351 265 520 185 (National fixed network call)
Fax: +351 265 520 186
Email: info@scitepress.org

EXTERNAL LINKS

PRIMORIS

INSTICC

SCITEVENTS

CROSSREF

PROCEEDINGS SUBMITTED FOR INDEXATION BY:

dblp

Ei Compendex

SCOPUS

Semantic Scholar

Google Scholar

Microsoft Academic

SCITEPRESS DIGITAL LIBRARY

Research.Publish.Connect.

Search by any title, abstract, authors...

Proceedings Papers Authors Advanced Search

Paper

Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta

In **Proceedings of the 1st Muhammadiyah International Conference on Health and Pharmaceutical Development - MICH-PhD,** 112-116, 2018 , East Jakarta, Indonesia

Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta

Numlil Khaira Rusdi[1], Dini Indah Komariah[1], Nora Wulandari[1], and Arya Govinda Roosheroe[2]

[1]Faculty of Pharmacy and Science, University Muhammadiyah Prof. DR. Hamka, Delima Street II/IV, Jakarta, Indonesia
[2]Division of Geriatric, Department of Internal Medicines, Cipto Mangunkusumo Hospital, Pangeran Diponegoro Street 71, Jakarta, Indonesia

Keywords: Geriatrics, STOPP/START Criteria, Potentially Inappropriate Medicine (PIM), Adverse Drug Reactions.

Abstract: Chronic diseases and decreased physiological function in geriatric patients play a role in the increased Potentially Inappropriate Prescribing (PIP) and Adverse Drug Reactions (ADR). STOPP/START Criteria (Screening Tool of Older Person's Prescriptions/Screening Tool to Alert to Right Treatment) is one of the screening tools to identify Potentially Inappropriate Prescribing. The purpose of this study was to find out how much Potentially Inappropriate Medicines (PIM) potential and Potency Prescribing Omissions (PPO) at X hospital using STOPP START toolkit. This was a non-experimental descriptive study. Samples were collected retrospective in January-March 2017. STOPP/START criteria were used as a screening tool to identify Potentially Inappropriate Medication (PIM) and Potential Prescribing Omissions (PPO). In 91 samples of outpatient geriatric at X hospital, the potential for PIM according to the STOPP Criteria was 1.9% of a total of 560 drugs with criteria were for the administration of benzodiazepines in patients with a history of falls, anticholinergics and antipsychotics in dementia patients, glimepiride administration in geriatric patients with DM type 2. For the potential of negligence in drug administration according to the START Criteria, there was 3.8% with the most occurrence being the administration of acetylcholinesterase inhibitors in dementia patients. Of the 560 medications administered to outpatient geriatric patients, 1.9% were included in the STOPP criteria and 3.8% included in the START criteria.

1 INTRODUCTION

The phenomenon of population ageing in a phenomenon that has occurred worldwide. Between 2015 and 2050, the population of 60 years or older is expected to increase from 12% to 22%. By 2050 it is estimated that the number of elderly people in the world reaches 2 billion inhabitants (Iona *et al.* 2015). In Indonesia, the elderly population in 2017 numbered approximately 23.66 million people (9.03%) and is estimated to increase to 48.19 million in 2035 (Kementrian Kesehatan RI 2017).

A large number of elderly population in Indonesia will have an impact on the health sector in the form of health decline which resulting in increased service costs (Kemuntrian Kesehatan RI 2017). Increasing age in the elderly can alter the body's physiological system, but it may also alter the pharmacokinetic and pharmacodynamic profile of the drug. The elderly group has multiple comorbidities and is more often hospitalized, which increases the risk of polypharmacy and the potential for inappropriate prescribing (Corsonello *et al.* 2009).

Some lists of drugs have been made by experts for use by medical circles in the treatment of geriatric patients i.e. Beers Criteria (The American Geriatrics Society 2012) or Canadian Criteria (McLeod *et al.* 1997). The STOPP/START Criteria (Screening Tool for Older Person's Prescriptions / Screening Tool to Alert to Right Treatment) were made to identify potentially inappropriate medication (PIM) (Gallagher *et al.* 2011). STOPP/START criteria were made according to the body's physiological system consisting of 80 STOPP Criteria and 34 START Criteria (O'Mahony *et al.* 2014). The STOPP/START criteria were created in 2003 with the aim of addressing the possible shortcomings of the Beers criteria. The criteria consist of Potentially Inappropriate Medication (PIM) described by STOPP, and Potential Prescribing Omissions (PPO) prescriptions.

112

Authors: Numlil Khaira Rusdi [1] ; Dini Indah Komariah [1] ; Nora Wulandari [1] and Arya Govinda Roosheroe [2]

Affiliations: [1] Universitas Muhammadiyah , Indonesia ; [2] Cipto Mangunkusumo Hospital, Indonesia

Keyword(s): Geriatrics, STOPP/START Criteria, Potentially Inappropriate Medicine (PIM), Adverse Drug Reactions

Abstract: Chronic diseases and decreased physiological function in geriatric patients play a role in the increased Potentially Inappropriate Prescribing (PIP) and Adverse Drug Reactions (ADR). STOPP/START Criteria (Screening Tool of Older Person's Prescriptions/Screening Tool to Alert to Right Treatment) is one of the screening tools to identify Potentially Inappropriate Prescribing. The purpose of this study was to find out how much Potentially Inappropriate Medicines (PIM) potential and Potency Prescribing Omissions (PPO) at X hospital using STOPP START toolkit. This was a non-experimental descriptive study. Samples were collected retrospective in January-March 2017. STOPP/START criteria were used as a screening tool to identify Potentially Inappropriate Medication (PIM) and Potential Prescribing Omissions (PPO). In 91 samples of outpatient geriatric at X hospital, the potential for PIM according to the STOPP Criteria was 1.9% of a total of 560 drugs with criteria were for the administration (More)

Full Text Download

CC BY-NC-ND 4.0

SciTePress user: Numlil Khaira Rusdi

My Papers

In the current month:
Recent papers: 500 available of 500 total
2+ years older papers: 4000 available of 4000 total

Paper citation in several formats:

Harvard | Bibtex | EndNote

Rusdi, N.; Komariah, D.; Wulandari, N. and Roosheroe, A. (2019). **Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta**. In *Proceedings of the 1st Muhammadiyah International Conference on Health and Pharmaceutical Development - MICH-PhD,* ISBN 978-989-758-349-0, SciTePress, pages 112-116. DOI: 10.5220/0008240301120116

Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta

Numlil Khaira Rusdi[1], Dini Indah Komariah[1],Nora Wulandari[1], and Arya Govinda Roosheroe[2]
[1]*Faculty of Pharmacy and Science, University Muhammadiyah Prof. DR. Hamka, Delima Street II/IV, Jakarta, Indonesia*
[2]*Divisi of Geriatric, Department of Internal Medicines, Cipto Mangunkusumo Hospital, Pangeran Diponegoro Street 71, Jakarta, Indonesia*

Keywords: Geriatrics, STOPP/START Criteria, Potentially Inappropriate Medicine (PIM), Adverse Drug Reactions.

Abstract: Chronic diseases and decreased physiological function in geriatric patients play a role in the increased Potentially Inappropriate Prescribing (PIP) and Adverse Drug Reactions (ADR). STOPP/START Criteria (Screening Tool of Older Person's Prescriptions/Screening Tool to Alert to Right Treatment) is one of the screening tools to identify Potentially Inappropriate Prescribing. The purpose of this study was to find out how much Potentially Inappropriate Medicines (PIM) potential and Potency Prescribing Omissions (PPO) at X hospital using STOPP START toolkit. This was a non-experimental descriptive study. Samples were collected retrospective in January-March 2017. STOPP/START criteria were used as a screening tool to identify Potentially Inappropriate Medication (PIM) and Potential Prescribing Omissions (PPO). In 91 samples of outpatient geriatric at X hospital, the potential for PIM according to the STOPP Criteria was 1.9% of a total of 560 drugs with criteria were for the administration of benzodiazepines in patients with a history of falls, anticholinergics and antipsychotics in dementia patients, glimepiride administration in geriatric patients with DM type 2. For the potential of negligence in drug administration according to the START Criteria, there was 3.8% with the most occurrence being the administration of acetylcholinesterase inhibitors in dementia patients. Of the 560 medications administered to outpatient geriatric patients, 1.9% were included in the STOPP criteria and 3.8% included in the START criteria.

SCITEPRESS SCIENCE AND TECHNOLOGY PUBLICATIONS

1 INTRODUCTION

The phenomenon of population ageing is a phenomenon that has occurred worldwide. Between 2015 and 2050, the population of 60 years or older is expected to increase from 12% to 22%. By 2050 it is estimated that the number of elderly people in the world reaches 2 billion inhabitants (Iona *et al.* 2015). In Indonesia, the elderly population in 2017 numbered approximately 23.66 million people (9.03%) and is estimated to increase to 48.19 million in 2035 (Kementrian Kesehatan RI 2017).

A large number of elderly population in Indonesia will have an impact on the health sector in the form of health decline which resulting in increased service costs (Kementrian Kesehatan RI 2017). Increasing age in the elderly can alter the body's physiological system, but it may also alter the pharmacokinetic and pharmacodynamic profile of the drug. The elderly group has multiple comorbidities and is more often hospitalized, which increases the risk of polypharmacy and the potential for inappropriate prescribing (Corsonello *et al.* 2009).

Some lists of drugs have been made by experts for use by medical circles in the treatment of geriatric patients i.e. Beers Criteria (The American Geriatrics Society 2012) or Canadian Criteria (McLeod *et al.* 1997). The STOPP/START Criteria (Screening Tool for Older Person's Prescriptions / Screening Tool to Alert to Right Treatment) were made to identify potentially inappropriate medication (PIM) (Gallagher *et al.* 2011). STOPP/START criteria were made according to the body's physiological system consisting of 80 STOPP Criteria and 34 START Criteria (O'Mahony *et al.* 2014). The STOPP/START criteria were created in 2003 with the aim of addressing the possible shortcomings of the Beers criteria. The criteria consist of Potentially Inappropriate Medication (PIM) described by STOPP, and Potential Prescribing Omissions (PPO) prescriptions,

Rusdi, N., Komariah, D., Wulandari, N. and Roosheroe, A.
Identification of Potentially Inappropriate Prescribing in Outpatient Geriatric using STOPP/START Criteria at X Hospital Jakarta.
DOI: 10.5220/0008240301120116
In *Proceedings of the 1st Muhammadiyah International Conference on Health and Pharmaceutical Development (MICH-PhD 2018)*, pages 112-116
ISBN: 978-989-758-349-0
Copyright © 2018 by SCITEPRESS – Science and Technology Publications, Lda. All rights reserved

Table 1. PIM Frequency According to STOPP Criteria

Criteria Code	Descriptions	N
K1	Benzodiazepin that increase the risk of falling in geriatric	4
A3	Concurrent use of one class drug or its derivatives	2
D8	Anticholinergics in geriatric patients with delirium or dementia	1
D9	Antipsychotics in the elderly with BPSD (dementia)	1
C3	Aspirin in the elderly with uncontrolled hypertension	1
J1	Glimepiride in the elderly with type 2 diabetes mellitus	1
	Total	10

Table 2. The Frequency of PPO According to Criteria START

Criteria Code	Descriptions	N
C3	Acetylcholinesterase inhibitors in dementia patients	5
G1	Alpha 1 blocker in patients with BPH	5
G2	5a reductase inhibitor in BPH patients	5
E3	Vitamin D and calcium in patients with osteoporosis	3
A4	Antihypertensive in patients with blood pressure> 140 / 90mmHg	1
E6	Xanthine oxidase inhibitors in gout arthritis patients	1
C4	Topical prostaglandin or prostamide or topical beta blockers in glaucoma patients	1
	Total	21

described by the START. This START method is intended to improve treatment success in geriatric patients (O'Mahony *et al.* 2014).

The result of PIM identification with STOPP and START screening tool has not been well documented in Indonesia especially in DKI Jakarta hospital. X Hospital (RSUPN DR. Cipto Mangunkusumo) is a government hospital located in Central Jakarta and is a referral of the National Geriatric Center. From the results of the survey to the hospital, the outpatient geriatric patients from January to March 2017 at X hospital were numbered 1047 patients.

2 METHOD

This experiment was a cross sectional study. Samples were collected retrospectively in January - March 2017. STOPP/START criteria were used as a screening tool to identify Potentially Inappropriate Medication (PIM) and Potential Prescribing Omissions (PPO). The total population of 1047 patients and samples taken according to Taro Yamane formula amounted to 91 using systematic sampling (Moch Imron 2011). Inclusion criteria were geriatrics aged 60 years or older, received the medicine, diagnosis data, physical examination data and laboratory data required. The exclusion criteria were patients with forced home, and the patient died.

The data collected were secondary data in the form of medical record number, patient initials, age, sex, diagnosis, comorbidities, physical examination, drugs used and laboratory information. Data analyzed using STOPP/START Criteria to determine the precision of prescribing that adjusted to the medical record of the patients.

3 RESULTS

The results of the study showed that improper use of medicines according to STOPP criteria included giving benzodiazepines which could potentially cause a risk of falls in the elderly. Besides that, there were also the used of drug duplication, anticholinergics, antipsychotics and Glimepiride (Table 1).

The results study, the PPO according to the START Criteria numbered to 3.8% or 21 incidents. The highest incidence in this study was an omission of acetylcholinesterase inhibitor therapy in 5 dementia patients, alpha-1 blocker therapy and 5a reductase inhibitor in patients with BPH of 5 cases,

respectively. Furthermore, vitamin D and calcium therapy were given in 3 patients with osteoporosis, antihypertensive in 1 geriatric patient with blood pressure> 140 / 90mmHg, xanthine oxidase inhibitor therapy in 1 patient with gout arthritis and topical prostaglandin or prostamide or beta-blocker therapy in 1 patient with glaucoma (Table 2).

4 DISCUSSION

The most prevalent PIM criteria were the use of benzodiazepine-class drugs in 4 geriatric patients (40%). The use of benzodiazepines class of drugs may lead to reduced sensory and impaired balance (O'Mahony *et al.* 2014). In the elderly the benzodiazepine profile may undergo changes related to altered cytochrome P450 enzyme activity (Sotaniemi *et al.* 1997) otherwise it may be caused by other things such as diminished albumin which leads to increased concentrations of benzodiazepines in a free form (Hammerlein *et al.* 1998). In the elderly there is also an increase in the sensitivity of benzodiazepines to the central nervous system (Hillmer *et al.* 2007; Sera *et al.* 2012; Naranjo *et al.* 1995). In a previous study, more than 40% of elderly who received benzodiazepine-class drugs entered emergency care after falling out (Cengotitabengoa *et al.* 2018).

Concurrent use of one class of drugs or the derivatives occurred to 2 patients (20%), i.e, the use of dopamine agonist (pramipexole and levodova) drugs. Drug duplication will increase as patients develop chronic illness and the range can reach 40.38% to 43.50% with 1.45-1.62 duplications (Cheng *et al.* 2014). Drug duplication were associated with polypharmacy which may increase the risk of adverse drug reactions (Bushardt *et al.* 2008). Constipation, nausea, headache and excessive daytime sleepiness are among adverse drug reactions of dopamine (Pagano *et al.* 2014; Tholfsen *et al.* 2015). Other adverse drug reactions such as hallucinations (both visual and audio), peripheral edema, heart valve disorders to heart failure have been reported as an adverse drug reaction of dopamine agonist therapy (Lockett *et al.* 2015; Wood 2010).

There is one incident (10%) of anticholinergics administered to dementia patients. The provision of anticholinergic prescriptions should be done cautiously given the side effects to the elderly. Adverse drug reactions of anticholinergic will worsen the state of dementia (O'Mahony *et al.* 2014; Gerretsen *et al.* 2011) . There is one incident (10%) of antipsychotics given in elderly patients. The antipsychotic administration was included in the STOPP Criteria as it may increase the risk of stroke in the elderly (O'Mahony *et al.* 2014). In previous studies, the use of antipsychotics in older adults may increase the cardiovascular risk to death. The risk will increase if the elderly develop dementia (Mittal *et al.* 2011).

The use of aspirin in the elderly was one incident (10%). When aspirin was given to uncontrolled hypertension (> 140 mmHg and > 90 mmHg) patients, it will increase the risk of bleeding (O'Mahony *et al.* 2014; Lip 2011; Pisters *et al.* 2010).

Glimepiride used with caution in elderly patients as it may lead to hypoglycemia (Katzung *et al.* 2012). In this study, there was one incident (10%), and in previous studies, there was an incidence of hypoglycemia in 23 patients out of a total of 143 patients (Shihara *et al.* 2017).

According to the START Criteria, there were three most potential *Omissions* in drug administration: acetylcholinesterase inhibitor therapy in dementia patients (23.8%), alpha 1 blocker therapy and 5a reductase inhibitor in patients with BPH (23.8%), vitamin D and calcium therapy in geriatric patients with osteoporosis. Study on the comparison of the use of acetylcholinesterase inhibitors with placebo found a significant difference seen from the value of ADAS-Cog (The Alzheimer's Disease Assessment Scale–Cognitive subscale) and MMSE (Mini Mental State Exam) after patients were given therapy for six months (Mochammad *et al.* 2017). Acetylcholinesterase inhibitors not only improve cognitive function but can also increase psychological function and habits (DiSanto *et al.* 2013).

Alpha 1 blockers administered together with a 5a reductase inhibitor are the START Criteria in BPH patients. In elderly who had moderate to severe prostate disturbance when given a combination of both drugs resulted in much better improvement compared with tamsulosin or dutasteride monotherapy (Roehrborn *et al.* 2008). Vitamin D and calcium therapy were PPO in 5 geriatric patients with osteoporosis. Vitamin D and calcium therapy are strongly recommended to improve the state of osteoporosis and prevent fractures (Weaver *et al.* 2016). In the study had found that the used of Vitamin D and calcium in osteoporosis patients can reduce the risk of fracture in the elderly group (Weaver *et al.* 2016).

Geriatric patients with blood pressure > 140 / 90mmhg included to the START Criteria for not

getting antihypertensive (O'Mahony *et al.* 2014). Blood pressure target for elderly (< 140/90mmHg), the treatment may be based on JNC8 guidelines and may be combined with expert consensus guidelines ACCF/AHA 2011 (Arthur *et al.* 2015).

In this study, xanthine oxidase inhibitor therapy in gout patients include to the START Criteria. Febuxostat was recommended if elderly patients have moderate to severe renal impairment (Fravel *et al.* 2011).

Geriatric patients with glaucoma who are not receiving antiglaucoma therapy (topical prostaglandin, prostamide or beta-blockers) included to the STOPP Criteria. Comparison of the effectiveness of topical prostaglandin (latanoprost bunod 0.024%) once daily in the afternoon showed better results than the topical beta blocker (timolol 0.5%) twice daily given to glaucoma patients for three months (Medeiros *et al.* 2016).

5 CONCLUSIONS

From the results of this study, it could be concluded from 560 drugs given to outpatient geriatric patients at X hospital, there is 1.9% of PIM incidence for STOPP criteria and 3.8% incidence of PPO for START criteria.

REFERENCES

Arthur, Miranda, Lindsay Saum, Jessica E Wilhoite. 2015. Hypertension Management: Making Sense of Guidelines and Therapy Options for the Elderly. In *Butle University Libraries.* Vol 3.

Bushardt, Reamer L, Emily B Massey, Temple W Simpson, Jane C Ariail, Kit N Simpson. 2008. Polypharmacy: Misleading, but manageable. In *Clinical Intervension in Aging*. Vol 3. 383-389.

Cengotitabengoa, Monica Martinez, Maria Jose Diaz Gutierrez, Ariadna Besga, Cristina Bermudez-Ampudia, Purificacion Lopez, Marta B. Rondon, Donna E. Stewart, Patricia Perez, Miguel Gutierrez, y Ana Gonzales-Pinto. 2018. Prescripcion de Benzodiazepinas y Caidas en Mujeres y hombres Ancianos. In *Rev Psiquiatr Salud Ment (Barc.)*. Vol 11.12-18.

Cheng, Shou-Hsia, Chen Chi Chen. Effects of Continuity of Care on Medication Duplication Among the Elderly. In Medical Care. Vol 52. 149-156.

Corsonello, Andrea, Luigi Pranno, Sabrina Garasto, Paolo Fabietti, Silvia Bustacchini, Fabrizia Lattanzio. 2009. Potentially Inappropriate Medication in Elderly Hospitalized Patients. In *Drugs Aging*. Vol 26. 31-39.

Disanto, Simona Gabriella, Federica Prinelli, Fulvio Adorni, Carlo Caltagirone, Massimo Musicco. 2013. A Meta-Analysis of the Efficacy of Donepezil, Rivastigmine, Galantamine and Memantine in Relation to Severity of Alzhaimer's Disease. In: *Journal of Alzhaimer's Disease*. Vol 35. 349-361.

Fravel, Michelle A, Michael E. 2011. Management of Gout in the Older Adult. In: *The American Journal of Geriatric Pharmacotherapy*. 271-285.

Gallagher PF, MN O'Connor, D O'Mahony. 2011. Prevention of Potentially Inappropriate Prescribing for Elderly Patient: A Randomized Controlled Trial Using STOPP/START Criteria. In *Clinical Pharmacology & Therapeutics.* Vol 89. 845-854.

Gerretsen, Philip, Bruce G. Pollock. 2011. Drugs with anticholinergic properties: a current perspective on use and safety. In: *Expert Opinion*. 751.

Hammerlein A, Derendorf H, Lowenthal DT. 1998. Pharmacokinetic and Pharmacodynamic changes in the Elderly: Clinical Implication. In *Clin Pharmacokinetic*. Vol 35. 49-64.

Hilmer SN, McLachlan AJ, Le Couteur DG. 2007. Clinical Pharmacology in the geriatric patient. In *Fundam Clin Pharmacol*. Vol 21. 217-230.

Iona, Murdoch, Sarah Turpin, Bree Johnston, Alasdair MacLullich, Eve Losman. 2015. *Geriatric Emergencies*. John Willey & Sons, Ltd. United Kingdom. 1.

Katzung, Bertram G, Susan B. Masters, Anthony J. Trevor. 2012. *Basic & Clinical Pharmacology*. Edisi XII. Mc Graw-Hill. New York. 738, 754.

Kementrian Kesehatan RI. 2017. *Analisis Lansia di Indonesia*. Pusat Data dan Informasi. Jakarta. 1-3.

Lip, Gregory Y. H. 2011. Implications of the CHA_2DS_2 VASc and HAS-BLED Scores for Thromboprophylaxis in Atrial Fibrilation. In: *The American Journal of Medicine*. Elseiver. 1-4.

Lockett, Katrina, Danielle DeBacker, Kimberly AB Cauthon. 2015. The Link Between Non-Ergot-Derived Dopamine Agonists and Heart Failure: How Strong Is It?. In *The Consultant Pharmacist*. Vol 30. 136-140.

McLeod, Peter J, Allen R. Huang, Robyn M. Tamblyn, David C. Gayton. 1997. Defining Inappropriate Practices in Prescribing for Elderly People: A National Consensus Panel. In: *Canadian Medical Association*. Vol 156. 385-391.

Medioros FA, Martin KR, Peace J, Scassellati Sforzolini B, Vittitow JL, Weinreb RN. 2016. Comparison of Latanoprostene Bunod 0,024% and Timolol Maleate 0,5 in Open-Angle Glaucoma or Ocular Hypertension: The LUNAR Study. In: *Am J Ophthalmol*. Volume 168 , 250 - 259

Mittal, Vikrant, Lekshminarayana Kurup, Deena Williamson, Sunanda Muralee, Rajesh R. Tampi. 2013. Risk of Cerebrovascular Adverse Events and Death in Elderly Patients With Dementia When Treated With Antipsychotic Medications: A Literature Review of Evidence. In: *American Journal of Alzheimer's Disease and Other Dementias*. 1-11.

Moch, Imron. 2011. *Statistika Kesehatan*. Sagung Setyo. Jakarta.

Mohammad, Dana, Parco Chan, Janelle Bradley, Krista Lanctot, Nathan Herrman. 2017. Acetylcholinesterase Inhibitor for Treating Dementia Sympyoms – A Safety Evaluation. In: *Expert Opinion on Drug Safety*, 16:9, 1009-1019

Naranjo CA, Herrmann N, Mittmann N, Bremner KE. Recent Advances in Geriatric Psychopharmacology. In: *Drug Aging*. Vol 7. 184-202.

O'Mahony, Denis, David O'Sullivan, Stephen Byrne, Marie Noelle O'Connor, Cristin Ryan, Paul Gallagher. 2014. STOPP/START Criteria for Potentially Inappropriate Prescribing in Older People: Version 2. In: *Age and Ageing*. Vol 44. 213-218.

Pagano, Gennaro, Echo E tan, Janelle M Haider, Alyssa Bautista, Michele Tagliati. 2014. Constipation is reduced by beta-blockers and increased by dopaminergic medications in Parkinson's disease. In: *Parkinsonism and Related Disorders*. 1-6.

Pisters, Ron, Deirdre A. Lane, Robby Nieuwlaat, Cees B. De Vos, Harry J. G. M. Crijns, Gregory Y. H. Lip. 2010. A Novel User-Friendly Score (HAS-BLED) To Assess 1-Year Risk of Major Bleeding in Patient With Atrial Fibrilation: The Euro Heart Survey. In: *American College of Chest Physicians*. United States. 1-10.

Roehrborn, Claus G, Paul Siami, Jack Barkin, Ronaldo Damião, Kim Major-Walker, Betsy Morrill, Francesco Montorsi. 2008. The Effects of Dutasteride, Tamsulosin and Combination Therapy on Lower Urinary Tract Symptoms in Men With Benign Prostatic Hyperplasia and Prostatic Enlargement: 2-Year Results From the CombAT Study. In *The Journal of Urology.*Vol 179. 616-621.

Sera LC, McPherson ML. 2012. Pharmacokinetics and Pharmacodynamic changes Assosiated with Aging and Implications for Drug Therapy. In *Clin Geriatri Med*. Vol 28. 273-286.

Shihara, Nobuyoki, Yasuo Terauci, Hitoshi Ishida, Masafumi Kitaoka, Jo Satoh, Daisuke Yabe, Yuichiro Yamada, Yutaka Seino. 2016. Efficacy and Safety Comparison of Sitagliptin and Glimepiride in Elderly Japanese Patients with type 2 Diabetes: Start J. In: *Diabetes Research and Clinical Practice*. 1-2.

Sotaniemi EA, Arranto AJ, Pelkonen O, Pasanen M. 1997. Age and Cytochrome P450-linked drug metabolism in humans: an analysis of 226 subjects with equal hispatologic conditions. In: *Clin Pharmacol Ther*. Vol 61. 331-339.

The American Geriatrics Society 2012 Beers Criteria Update Expert Panel. 2012. Americans Geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. In: *JAGS*. Vol 60. 616-631.

Tholfsen, Lena K, Larsen Jan P, Jorn Schulz, Ole Bjorn Tysnes, Michaela D Gjerstad. 2015. Development of excessive daytime sleepiness in early Parkinson disease. In: Neurology Jul 2015, 85 (2) 162-168

Weaver CM, D Alexander, CJ Boushey, B Dawson-Hughes, JM Lappe, MS LeBoff, S Liu, AC Looker, TC Wallace, DD Wang. 2016. Calcium plus vitamin D supplementation and risk of fractures: an updated meta-analysis from the National Osteoporosis Foundation. In: *Osteoporosis International.* Vol 27. 367-376.

Wood LD. Clinical review and treatment of select adverse effects of dopamine receptor agonists in Parkinson's disease. In: *Drugs Aging*. Vol 27. 295-310.

SCITEPRESS SCIENCE AND TECHNOLOGY PUBLICATIONS