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Age and Gender Differences in the Pattern of Antiplatelet Agents Prescribing

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Aim: There is a scarcity of data regarding gender and age related aspects of antiplatelet drugs utilization in the outpatient setting. Thus, the objective of the present study was to determine the age-and gender-related differences in the outpatient use of antiplatelet drugs in Alkharj.
Methodology: This is a retrospective study that include the assessment of electronic prescriptions in the outpatient setting that include an antiplatelet drug in 2018.
Results: Ticagrelor was prescribed mainly for patients more than 60 years old (84.62%). Clopidogrel was prescribed mainly for patients more than 50 years old (79.76%) and aspirin also was prescribed mainly for patients more than 50 years old (71.67%). Generally, most of the patients who received antiplatelet agents were male (52.76%).
Conclusion: The present study showed that there were differences in prescribing antiplatelet agents between different gender and different ages. So it is important to know the prescribing trends and to give the appropriate drugs based on several factors such as gender and age. It is expected that in the future, antiplatelet therapy may be based on age and on endogenous sex hormone level or genetic female/male differences.

Keywords: Age related; antiplatelet; gender related; prescribing pattern.

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1. INTRODUCTION

Platelets promote atherothrombotic disorders including embolic strokes, acute coronary syndrome and peripheral vascular disease. The use of antiplatelet agents in clinical practice leads to a significant difference in how we treat these diseases and was also associated with marked decreases in mortality and morbidity rates [1–3].

The significance of platelet involvement in coronary thrombosis was suggested by the effects of antiplatelet therapy on the incidence of pulmonary embolism and venous thrombosis mainly in surgical and high-risk medical patient [4].

Some of these antiplatelet drugs such as aspirin and clopidogrel are already extensively used. Moreover, there are nowadays newer agents such as ticagrelor and prasugrel have been licensed and are now being used in the place of clopidogrel in some patients. These antiplatelet drugs are used to reduce platelet function and the contribution of platelets to thrombus formation [4].

Previous studies showed that there are significant gender differences in health care utilization and drug prescribing patterns between the genders in Sweden, Europe and the United States. Generally, females use more prescription drugs [5–12] and also more health care than males [13–15]. Improving drug prescription pattern and intervened use at the same time leads to the appropriate compliance in the patient outcomes [16].

There is a scarcity of data regarding gender and age related aspects of antiplatelet drugs utilization in the outpatient setting. Thus, the objective of the present study was to determine the age-and gender-related differences in the outpatient use of antiplatelet drugs in Alkharj.

2. METHODOLOGY

This is a retrospective study that include the assessment of electronic prescriptions in the outpatient setting that include an antiplatelet drug in 2018. Accordingly, prescriptions in the inpatient setting, the prescriptions before or after 2018 and the prescriptions that don't contain an antiplatelet drug were excluded.

Participant ages were divided to different age categories; each patient was assigned to one of these categories. Use of antiplatelet drug was defined as filling at least 1 prescription for this medication during the study year. Moreover, each participant was assigned to male or female according to gender to find the difference in prescribing patterns according to age and gender.

The data were collected using Excel sheet and the percentage and number of males and females that used each drug were established. In addition to that the percentage and number of patients in different age categories that used an antiplatelet were established. This study was approved previously by the official Institutional Review Board with IRB log number 2019-0153E.

3. RESULTS AND DISCUSSION

In 2018, 707 patients receiving antiplatelet agents in the outpatient setting in Alkharj. Most of the patients were more than 50 years old (73.84%). Table 1 shows the age of the patients who received an antiplatelet agent in 2018.

Table 1. Age of the patients receiving antiplatelet agents

Age	Number	Percentage
Less than 20	3	0.42%
20-29	14	1.96%
30-39	38	5.37%
40-49	130	18.39%
50-59	191	27.02%
≥ 60	331	46.82%

Ticagrelor was prescribed mainly for patients more than 60 years old (84.62%). Clopidogrel was prescribed mainly for patients more than 50 years old (79.76%) and aspirin also was prescribed mainly for patients more than 50 years old (71.67%). Table 2 shows the age differences in the pattern of antiplatelet agents prescribing.

Most of the patients who received antiplatelet agents were male (52.76%). Gender of the patients receiving Antiplatelet agents is shown in Table 3.

All of the antiplatelet agents were prescribed mainly to male patients. About 92.31% of Ticagrelor, 55.36% of Clopidogrel and 50.95% of Aspirin were prescribed for male patients. Gender differences in the pattern of antiplatelet agents prescribing is shown in Table 4.

Table 2. Age differences in the pattern of antiplatelet agents prescribing

Drug	Less than 20	20-29	30-39	40-49	50-59	≥ 60	Total
Ticagrelor	0	0	0	2	0	11	13
Clopidogrel	0	1	9	24	45	89	168
Aspirin	3	13	29	104	146	231	526

Table 3. Gender of the patients receiving antiplatelet agents

Gender	Number	Percentage
Male	373	52.76%
Female	334	47.24%

Table 4. Gender differences in the pattern of antiplatelet agents prescribing

Drug	Male	Female	Total
Ticagrelor	12	1	13
Clopidogrel	93	75	168
Aspirin	268	258	526

Lisabeth et al reported that studies from several countries such as Canada, Sweden and the United Kingdom have revealed that fewer females than males were prescribed antiplatelet or antithrombotic therapy at discharge. No sex differences have been found in comparable studies in The United States of America [17]. Moreover, Meyer et al reported that in patients with stroke, females are 30% less likely to be treated with tissue plasminogen activator than males. They also reported that aspirin was less effective in inhibiting the aggregation of platelets in postmenopausal females than in males with a history of previous stroke or transient ischemic attack [18].

Sacco et al stated that fundamental guidelines for cardiovascular diseases' prevention in females recommend aspirin therapy in doses between 75–325 mg daily for high-risk women unless contraindicated, and in women age 65 years or older, aspirin should be considered in lower doses of 81 mg daily or 100 mg every other day if blood pressure is controlled and if the prospective benefit of preventing ischemic stroke or myocardial infarction is greater than the risk of adverse effects such as gastrointestinal bleeding and hemorrhagic stroke [19]. In addition to that, Patti et al reported that data from previous studies don't exclude gender-specific effects on clinical outcomes with antiplatelet agents and that differences in platelet function, vascular factors, and coagulation mechanisms in different vascular beds, partly related to hormonal status, might contribute, although strong evidence is lacking [20].

Hobson et al stated that differences in clotting tendency and response to antiplatelet therapy may contribute to the excess risk observed in young women but aren't observed in older females [21]. Additionally, Becker et al revealed that females experienced the same or greater decreases in platelet reactivity after aspirin therapy, retaining modestly more platelet reactivity compared with males. However, most females achieved total suppression of aggregation in the direct cyclooxygenase-1 pathway, the supposed mechanism for aspirin's cardio protection [22].

Bailey et al reported that sex-based differences in the prevalence and presentation of arterial and venous thrombosis exist, and emerging data indicate that males and females do not accrue equal benefit from antithrombotic therapy. In particular, the ability of aspirin therapy as primary prevention to lower MI in males and stroke in females and the differences in treatment benefit of GPIIb/IIIa inhibitors in women with acute coronary syndromes may reflect differences in the nature, burden, and presentation of atherosclerotic disease between females and males [23]. As well, Cirillo et al stated that males were more often treated with dual antiplatelet therapy and that ticagrelor was the most prevalent strategy, regardless of gender, clopidogrel was preferred in females and prasugrel was preferred in males [24].

Koopman stated that age differences in cardiovascular medication use tended to attenuate over time, whereas gender differences persisted [25]. Moreover, Simpson et al reported that females with ischemic stroke were less likely to receive either an antiplatelet or warfarin or statin therapy than males and that female patients with atrial fibrillation received more antiplatelet therapy but less warfarin than male patients. They also stated that important sex and age differences exist in the care of patients with stroke and suggest that women and the elderly need to be targeted for secondary prevention therapy [26].

4. CONCLUSION

The present study showed that there were differences in prescribing antiplatelet agents between different gender and different ages. So it is important to know the prescribing trends and to give the appropriate drugs based on several factors such as gender and age. In addition to the differences in antiplatelet drugs prescribing, previous studies showed that there were also differences in the efficacy and safety of these agents among different gender and ages. It is expected that in the future, antiplatelet therapy may be based on age and on endogenous sex hormone level or genetic female/male differences.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the author and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the author.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, patients' consent and ethical approval have been collected and preserved by the authors

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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