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Use of lipid modifying agentsin Miri Hospital

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Abstract

Introduction: In Malaysia, cardiovascular disease (CVD) is an important cause of morbidity and mortality in both men and women. The common cardiovascular (CV) risk factors include hypercholesterolemia, diabetes, hypertension overweight/obesity and smoking. Lipid lowering agents widely used worldwide to reduce the risk of coronary events. However, there is wide variation in the selection and use of these agents. This study aims to analyse the prescription patterns and its relationship with costs of lipid-lowering agents in Hospital Miri.

Methods: Data on drug prescriptions gathered from Pharmacy Information System (PhIS) to support medical practice in Hospital Miri from January to December 2017. ATC/DDD methodology used. Annual cost of the lipid lowering agents prescribed also determined. Total dose for every active ingredient calculated. Number of DDDs per-1,000 inhabitants' per-day

statistically determined according to WHO ATC/DDD system. Costs analysed by calculating the cost/DDD for each active ingredient based on the price purchased by Logistics Department of Pharmacy Hospital Miri.

Results: In 2017, statin is the most prescribed lipid modifying agent (97.3%) in Hospital Miri, followed by fibrates (0.77%), other modifying agent (0.14%), and HMG CoA reductase inhibitors in combination with other lipid modifying agents (0.57%). The most prescribed statin was atorvastatin (57%), followed by simvastatin (43%), pravastatin (0.34%) and rosuvastatin (0.22%).

Conclusion: Atorvastatin and simvastatin commonly prescribed as they are safe, cost effective and well-tolerated by patients. Statin therapy will continue to play a major role in reducing cardiovascular health burden and health care cost in midst of increasing prevalence of CV risk factors among Malaysia adult population.

Keywords: *Statin, lipid modifying agents, prescribing pattern*

Introduction

In Malaysia, cardiovascular disease (CVD) remains a major contributor of mortality and disease related morbidity. The prevalence of all major modifiable CV risk factors such as diabetes, hypertension, smoking, hypercholesterolemia and overweight remains high and is increasing in trend as reported in National Health and Morbidity Survey (NHMS) 2006 – 2015 (1,2).The prevalence of hypercholesterolemia saw an increase from 20.5% in 2006 to 47.7% in 2015 (3). In addition, NHMS 2015 reported that 43.2% of Malaysia adult population (≥18 years old) had at least 2 of the modifiable CV risk factors mentioned and the prevalence increases form the age of 30 years (3).

Based on National Cardiovascular Disease – Acute Coronary Syndrome (NCVD-ACS) Registry 2011-2013majority of the patients (96.8%) had at least one established CV risk factor – hypertension (65%), diabetes (46%) and dyslipidemia (37%). In addition, the survey indicated that Malaysians developed ACS at younger age (mean 58.5 years) compared to those in Thailand (mean 63.5 years),mainland China (mean 63 years) and Singapore (mean 68.3-69.2 years) (4).

Substantial systemic reviews and epidemiological studies consistently showed reducing total cholesterol (TC) and low-density lipoprotein (LDL) cholesterol prevents CVD and CV related mortality and morbidity (5-9). Hence, lipid modifying agents such as statins area the mainstay in managing dyslipidemia and its usage continues to increase in the next few years (10).Lipid modifying agents (ATC C10) is consistently the 4th most utilized drugs from year 2011 to 2014 with increment of 47.3% during 2011-2014 in the public sector.

Methods

Data on drug prescriptions gathered from Pharmacy Information System (PhIS) to support medical practice in Hospital Miri from January to December 2017. ATC/DDD methodology was used. Annual cost of the lipid lowering agents prescribed also determined. Total dose for every active ingredient calculated. Number of DDDs per-1,000 inhabitants' per-day statistically determined according to WHO ATC/DDD system. Costs analysed by calculating the cost/DDD for each active ingredient based on the price purchased by Logistics Department of Pharmacy Hospital Miri.

Results and Discussion

In 2017, statin is the most prescribed lipid modifying agent (97.3%) in Hospital Miri, followed by fibrates (0.77%), other modifying agent (0.14%), and HMG CoA reductase inhibitors in combination with other lipid modifying agents (0.57%)(Table 1). The most prescribed statin was atorvastatin (57%), followed by simvastatin (43%), pravastatin (0.34%) and rosuvastatin (0.22%) (Figure 2). Fibrateswas the second most commonly prescribed lipid modifying agent (Table 1). Two major fibrates being used in Hospital Miri are gemfibrozil (60.6%) and fenofibrate (39.4%).Another lipid modifying agent with minimal usage is ezetimibe which acts as cholesterol absorption inhibitor in intestine. Low usage of ezetimibe is mainly due to the high cost per unit as there is no generic formulation available.Whereas, HMG CoA reductase inhibitors in combination with other lipid modifying agent (simvastatin with ezetimibe) is the least prescribed (0.57%) among lipid modifying agents in Hospital Miri.

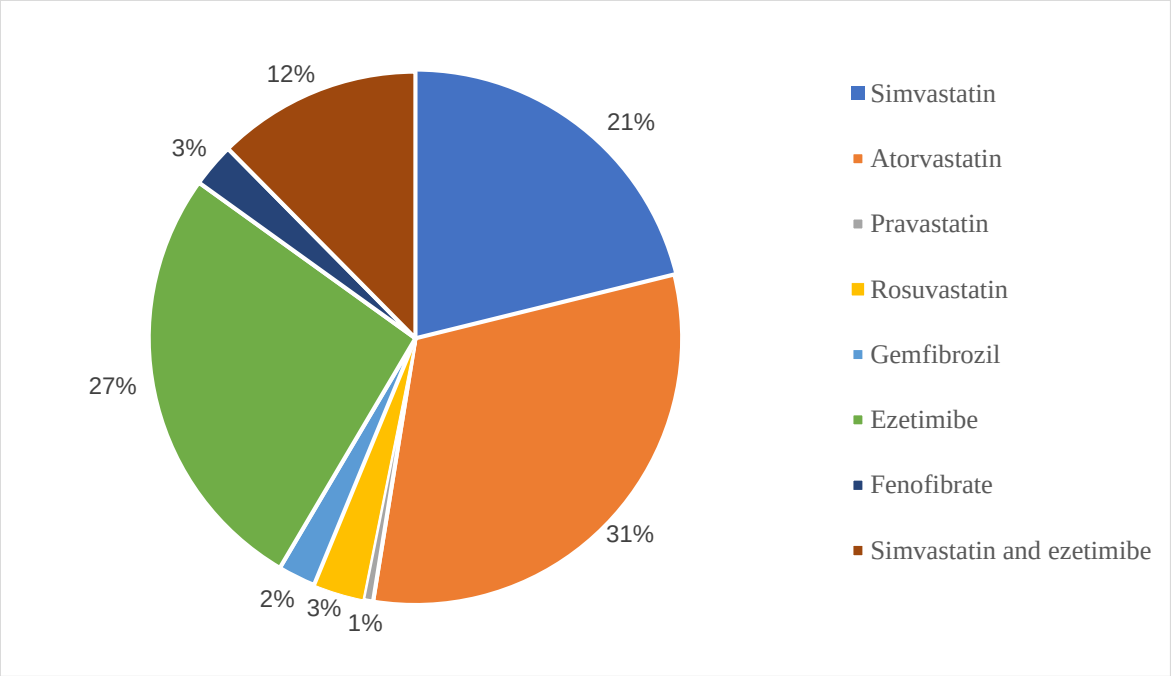

Figure 1. Cost comparison of lipid modifying drugs in Hospital Miri, Sarawak in year 2017

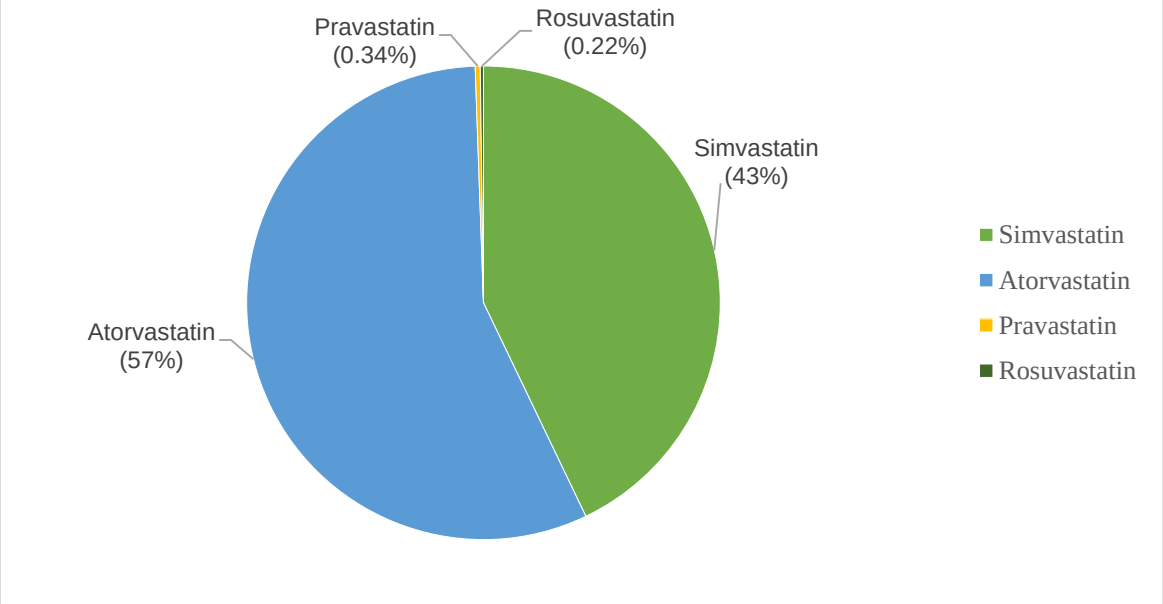

Figure 2. Distribution of statins usage in Hospital Miri 2017

Table 1. Use of lipid modifying agents by therapeutic group in DDD/1000 inhabitants/day in 2017

ATC	Therapeutic Group	2017
C10	**Lipid modifying agents**	**14.9201**
C10A	**Lipid modifying agents, plain**	**14.8354**
C10A A	HMG CoA reductase inhibitors	14.5117
C10A B	Fibrates	0.1156
C10A X	Other lipid modifying agents	0.2081
C10B	**Lipid modifying agents, combinations**	**0.0847**
C10B A	HMG CoA reductase inhibitors in combination with other lipid modifying agents	0.0847

Table 2. Use of lipid modifying agents by drugs in DDD/1000 inhabitants/day in 2017

ATC	Drug	2017
C10A A	**HMG CoA Reductase Inhibitors**	
C10A A01	Simvastatin	6.2232
C10A A05	Atorvastatin	8.2071
C10A A03	Pravastatin	0.0494
C10A A07	Rosuvastatin	0.0320
C10A B	**Fibrates**	
C10A B04	Gemfibrozil	0.0700
C10A B05	Fenofibrate	0.0456
C10A X	**Other lipid modifying agents**	
C10A X09	Ezetimibe	0.2081
C10B A	**HMG CoA Reductase inhibitors in combination with other lipid modifying agents**	
C10B A02	Simvastatin and ezetimibe	0.0847

In term of cost, a total of RM191,920.55 spent on lipid modifying agents in Hospital Miri with most of it spent on statins (56.1%), followed by fibrates (5%), other lipid modifying agent (ezetimibe) (26.5%) and HMG CoA reductase inhibitors in combination with other lipid modifying agents (simvastatin with ezetimibe) (12.4%). Atorvastatin being the most prescribed statin in Hospital Miri, accounted for 31% of the cost spent on lipid modifying agents, followed by ezetimibe (26.5%) and simvastatin (21%). Discrepancy between the low usage of ezetimibe (0.14%) and high cost (26.5%) is mainly due to the lack of generic formulation. High usage of atorvastatin and simvastatin are mainly due to the relatively affordable price of generic alternative. In addition, atorvastatin and simvastatin consistently showed high efficacy of LDL reductions and favourable safety profile (11).

Conclusion

In conclusion, atorvastatin and simvastatin commonly prescribed as they are safe, cost effective and well-tolerated by patients. Statin therapy will continue to play a major role in reducing cardiovascular health burden and health care cost in midst of increasing prevalence of CV risk factors among Malaysia adult population.

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