



## LIPID LOWERING AGENTS PRESCRIBING PATTERNS AMONG INTENSIVE CARE UNIT PATIENTS AT THE JORDANIAN ROYAL MEDICAL SERVICES HOSPITALS

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### ABSTRACT

**Introduction:** In order to reduce the risks associated with dyslipidemia and atherosclerotic cardiovascular illnesses, lipid-lowering agents are frequently used essential medications. These medications work to alter lipid metabolism, mainly focusing on blood cholesterol levels, playing a major role in the prevention and treatment of atherosclerosis and associated cardiovascular events by focusing on lowering low-density lipoprotein cholesterol (LDL-C) and triglyceride concentrations while frequently increasing high-density lipoprotein cholesterol (HDL-C).

**Objective:** The primary objective of this retrospective study is to analyze and assess the variations in lipid lowering agents prescribing patterns among Intensive Care Unit (ICU) patients at the Jordanian Royal Medical Services (JRMS) hospitals over the three-year period from 2019 to 2021, particularly for Atorvastatin, Simvastatin, Rosuvastatin, and Gemfibrozil.

**Methodology:** This retrospective study utilized electronic medical records obtained from Hakeem Health System used in JRMS, extracting medication prescription data for the selected years. The dataset included information on Atorvastatin, Simvastatin, Rosuvastatin, and Gemfibrozil prescriptions for ICU patients, documenting the number of cases for each medication in the years 2019, 2020, and 2021 then statistical analyses would be used to identify any trends in the use of those medications.

**KEYWORDS:** Lipid-lowering agents, intensive care unit, prescribing patterns, Atorvastatin, Simvastatin, Rosuvastatin, Gemfibrozil, Jordanian Royal Medical Services, Hakeem Health System, retrospective study.

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## 1. INTRODUCTION:

Globally, cardiovascular illnesses continue to be one of the primary causes of morbidity and death, emphasizing the significance of effectively managing risk factors like dyslipidemia<sup>[1,3]</sup>. Statins and fibrates are two examples of lipid-lowering medications that are now essential for preventing atherosclerotic cardiovascular disorders<sup>[3]</sup>. The purpose of this research is to examine the prescription practices for these medications for patients in the intensive care unit (ICU) of Jordanian Royal Medical Services (JRMS) hospitals during the three-year period between 2019 and 2021. Comprehending these trends is essential for refining therapy approaches and enhancing patient results.

### 1.1 Background:

Dyslipidemia is a common disorder linked to a higher risk of atherosclerotic cardiovascular events. Managing dyslipidemia presents special difficulties for severely ill patients, especially those in intensive care units and therefore lipid-lowering medication must be approached carefully because of the complex interactions among systemic inflammation, lipid metabolism, and severe illness<sup>[4]</sup>.

### 1.2 Rationale:

The need to close the current knowledge gap about the prescribing trends of lipid-lowering agents in intensive care unit patients is the driving force behind this study. By concentrating on the years 2019 to 2021 our objective is to offer a thorough comprehension of the patterns and discrepancies in the administration of Atorvastatin, Simvastatin, Rosuvastatin, and Gemfibrozil in various JRMS hospitals.

## 2. METHOD:

### 2.1 Data Source:

Hakeem Health System's electronic medical records used at JRMS hospitals offered a wealth of data for this retrospective study. The incorporation of several JRMS hospitals guarantees a broad and varied sample, reflecting the subtleties of prescribing procedures in various healthcare settings.

### 2.2 Hospitals Included:

The inclusion of prominent JRMS hospitals, such as King Hussein Medical Hospital, Queen Alia Heart Institute, King Talal Military Hospital, Queen Rania Pediatric Hospital, Princess Haya Military Hospital, Prince Ali bin Al Hussein Military Hospital, Prince Hashem bin Al Hussein Hospital, and Prince Hashem bin Abdullah II Hospital, guarantees a comprehensive overview of lipid-lowering agent prescribing patterns within the JRMS.

### 2.3 Statistical Analysis:

While year-by-year analyses will provide a thorough investigation of variations, descriptive statistics will be utilized to provide a broad summary of prescribing patterns. The display of prescription trends will be improved by the use of graphic representations.

## 3. RESULTS:

### 3.1 Overview of Prescribing Patterns (See Table 1):

The prescribing patterns of Atorvastatin, Simvastatin, Rosuvastatin, and Gemfibrozil across the years 2019 to 2021 reveal intriguing trends. Atorvastatin emerges as the most frequently prescribed lipid-lowering agent, with a noticeable increase from 2019 to 2021. Simvastatin and Rosuvastatin exhibit fluctuations, while Gemfibrozil remains relatively stable across the three years.

**Table 1: Overview of Prescribing Patterns**

Medication	2019	2020	2021
c	2897	2523	3482
Simvastatin	382	699	276
Rosuvastatin	28	34	21
Gemfibrozil	24	36	32
Total	3331	3292	3811

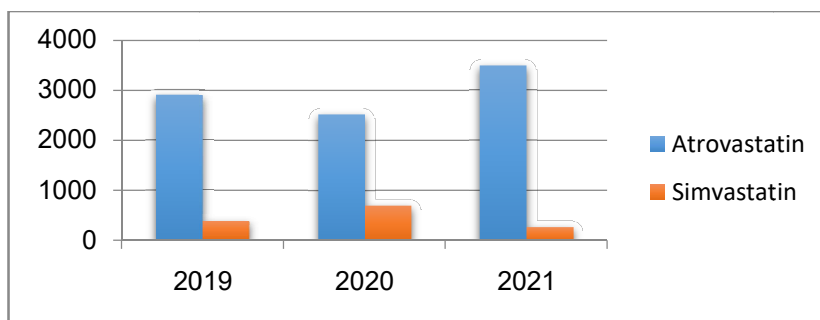


Figure 1: Trends of prescription of atorvastatin and simvastatin

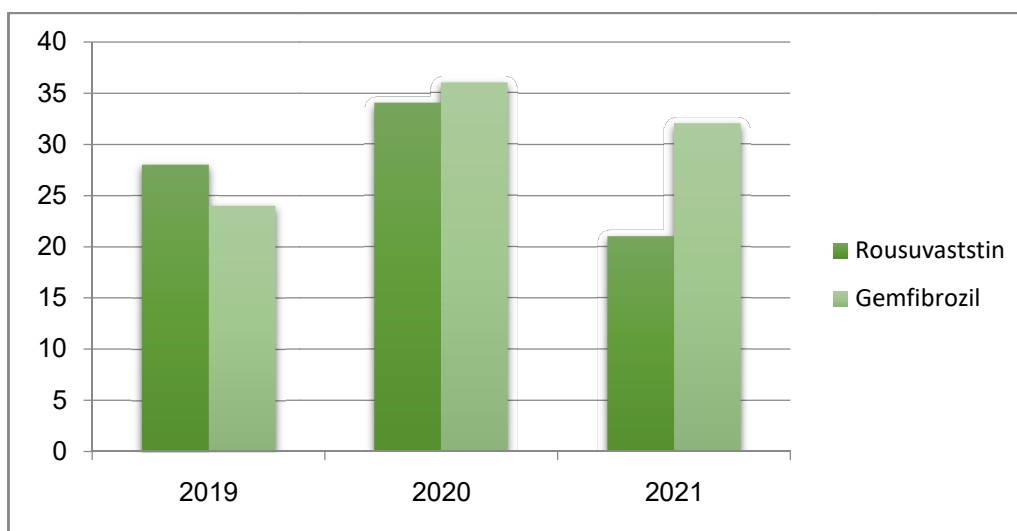


Figure 2: Trends of prescription of rosuvastatin and gemfibrozil

**3.2 Yearly Trends:**

Yearly trends indicate dynamic shifts in prescribing practices (table 2). Many reasons may be behind

these variations including availability issues, emerging clinical evidence, changes in treatment guidelines, and the introduction of new lipid-lowering agents<sup>[5]</sup>.

**Table 2: Yearly trends of prescribing practices**

Medication	2019	2020	2021	2019-2020 Change Percentage	2020-2021 Change Percentage
Atorvastatin	2897	2523	3482	-12.91%	38.01%
Simvastatin	382	699	276	82.98%	-60.52%
Rosuvastatin	28	34	21	21.43%	-38.24%
Gemfibrozil	24	36	32	50.00%	-11.11%
Total	3331	3292	3811	-1.17%	15.77%

**4. DISCUSSION:**

**4.1 Interpreting Prescribing Patterns:**

Analyzing the results in the context of existing literature and clinical guidelines will provide

insights into the rationale behind prescribing patterns. For example, the increased use of Atorvastatin may align with its proven efficacy and safety profile and wide availability and cost

effectiveness compared with other lipid lowering agents in the Jordanian market<sup>[6,7]</sup>.

#### 4.2 Yearly Dynamics:

The yearly dynamics observed in prescribing patterns warrant exploration into the external factors influencing clinical decision-making. Consideration of updated guidelines, emerging clinical trial data, and shifts in the landscape of cardiovascular medicine will enrich the discussion.

#### 5. CONCLUSIONS:

The thorough examination of the prescribing trends for lipid-lowering medications among JRMS ICU patients highlights the significance of optimizing dyslipidemia therapy in critically ill patients and provides insightful information about existing procedures. This study investigates the dynamics of lipid-lowering therapy in a critical care context by looking at prescription behavior patterns for drugs including Atorvastatin, Simvastatin, Rosuvastatin, and Gemfibrozil across a three-year period from 2019 to 2021.

The study's findings provide a substantial contribution to the body of knowledge in a number of ways. First of all, they help medical practitioners make more informed clinical decisions by providing a greater insight of the prevalent trends and inconsistencies in the prescription of lipid-lowering drugs in JRMS hospitals. Second, this study may serve as a foundation for analyzing the causes of the trends and fluctuations that have been identified. It also identifies possible areas where methods for managing dyslipidemia in intensive care units could be improved.

Additionally, the study's conclusions also have consequences for further investigation and medical practice. This study draws attention to the rising use of Atorvastatin and the erratic patterns in the prescriptions for Simvastatin, Rosuvastatin, and Gemfibrozil. It also highlights the need for more research into the variables that affect prescribing decisions, including new clinical evidence, updated treatment guidelines, and drug availability.

Furthermore, the knowledge gained from this research lays the groundwork for optimizing lipid-

lowering medication in critically sick patients, both in JRMS hospitals and in other healthcare settings across the world. Healthcare professionals can better fulfill the needs of ICU patients with dyslipidemia by customizing their treatment approaches based on their understanding of the underlying dynamics of prescribing patterns. This will ultimately improve patient outcomes and lessen the burden of cardiovascular illnesses.

The present study concludes that consistent monitoring and assessment of prescribing practices in intensive care unit (ICU) settings is crucial in guaranteeing the provision of patient-centered and evidence-based care. Going forward, the focus should be on implementing strategies into practice that will improve the safety and efficacy of lipid-lowering therapy, which will raise the standard of care given to critically sick patients with dyslipidemia.

#### 6. LIMITATIONS OF THE STUDY:

##### 6.1 Retrospective Nature:

The retrospective design introduces inherent limitations, including the dependence on the accuracy of historical data and the possibility of confounding variables not recorded in electronic records.

##### 6.2 Generalizability:

Although having a wide range of JRMS hospitals increases the study's representativeness, care must be used when extrapolating the results outside of the JRMS network.

##### 6.3 Data Completeness:

The accuracy of prescribing patterns may be impacted by inaccurate or incomplete recording in electronic data, which could compromise the overall reliability of the study.

**Conflict of Interest:** The authors of this paper affirm that there are no conflicts of interest pertaining to the researchers or affiliated institutions engaged in the study.

#### REFERENCES:

1. Wilson PWF, Polonsky TS, Miedema MD, et al. Systematic review for the 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA

guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart

- Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019; 139:e1144–61. DOI: 10.1161/CIR.0000000000000626.
2. Stamler J, Wentworth D, Neaton JD. Is relationship between serum cholesterol and risk of premature death from coronary heart disease continuous and graded? Findings in 356 222 primary screenees of the Multiple Risk Factor Intervention Trial (MRFIT). *JAMA*. 1986; 256:2823–8.
  3. Baigent C, Blackwell L, Emberson J, et al. Efficacy and safety of more intensive lowering of LDL cholesterol: a meta-analysis of data from 170 000 participants in 26 randomised trials. *Lancet*. 2010; 376:1670–81.
  4. Collins R, Reith C, Emberson J, et al. Interpretation of the evidence for the efficacy and safety of statin therapy. *Lancet*. 2016; 388:2532–61.
  5. Qi K, Reeve E, Hilmer SN, et al. Older people's attitudes regarding polypharmacy, statin use and willingness to have statins deprescribed in Australia. *Int J Clin Pharm*. 2015; 37:949–57.
  6. Group HPSC. Randomized trial of the effects of cholesterol-lowering with simvastatin on peripheral vascular and other major vascular outcomes in 20 536 people with peripheral arterial disease and other high-risk conditions. *JVasc Surg*. 2007; 45:645–54.; discussion 53–4.
  7. Athyros VG, Papageorgiou AA, Mercouris BR, et al. Treatment with atorvastatin to the National Cholesterol Educational Program goal versus 'usual' care in secondary coronary heart disease prevention. The GREek Atorvastatin and Coronary-heart-disease Evaluation (GREACE) study. *Curr Med Res Opin*. 2002; 18:220–8.
  8. Bellosa S, Corsini A. Statin drug interactions and related adverse reactions. *Expert Opin Drug Saf*. 2012; 11:933–46.
  9. Cannon, Christopher P., et al. "Intensive versus moderate lipid lowering with statins after acute coronary syndromes." *New England Journal of Medicine* 350.15 (2004): 1495-1504.
  10. Jun, M., et al. "Effects of fibrates on cardiovascular outcomes: a systematic review and meta-analysis." *The Lancet* 375.9729 (2010): 1875-1884.

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