Impact of Atorvastatin and Rosuvastatin in Patients Depending on Risks and Age Groups

Department of Pharmaceutical Technology, Brainware University, 398, Ramkrishnapur Road, Barasat, Kolkata 700125.

Abstract

The administration of statins, especially Atorvastatin and Rosuvastatin, is crucial in the treatment of dyslipidemia and the avoidance of cardiovascular events. The study was conducted to contrast the effect of Atorvastatin and Rosuvastatin in patients with different cardiovascular risk and age categories based on LDL and total cholesterol levels. 47 patients' data were hypothetically simulated according to real-life patterns, with Atorvastatin being the drug of choice for low to moderate LDL levels and Rosuvastatin for high to very high levels. The outcomes revealed that there was slightly more efficacy in LDL lowering with Rosuvastatin among high-risk patients, whereas Atorvastatin was effective in lower-risk patients. The study goes on to support risk-based statin choice in clinical pharmacy practice, particularly in the Indian setting.Cardiovascular diseases (CVDs) are the leading cause of mortality worldwide, driven significantly by elevated low-density lipoprotein cholesterol (LDL-C). Statins—HMG-CoA reductase inhibitors—are essential for managing dyslipidemia, reducing LDL-C, and preventing cardiovascular events. Among them, **Atorvastatin and Rosuvastatin** are widely prescribed. Although both are effective, Rosuvastatin is considered more potent and is often reserved for high-risk patients, while Atorvastatin is typically used for mild to moderate cases. Treatment selection therefore depends on LDL-C levels, age, and overall, 10-year cardiovascular risk.The primary aim of this study is to evaluate and compare the **effectiveness and prescribing patterns** of

Atorvastatin vs Rosuvastatin among different age and risk groups in community pharmacy settings. Since access to real patient data is limited due to privacy and logistical reasons, we created a **fictional yet realistically modeled dataset** of **47 simulated patients** from West Bengal, India. We assigned each patient a typical Bengali name, age (35–70 years), LDL-C level (ranges from ~90 to 200 mg/dL), total cholesterol level, and the statin they would realistically be prescribed based on pharmacist feedback and standard clinical guidelines.To enhance clinical context, we employed the **ASCVD Risk Estimator Plus** application, freely available on iOS and Android. This tool calculates a patient's estimated 10-year risk of atherosclerotic cardiovascular disease (ASCVD) by incorporating parameters such as age, LDL-C, systolic blood pressure, smoking status, and diabetes history. Though our patient data is hypothetical, using this app allows demonstration of how pharmacists might apply guideline-based algorithms in decision-making.For analysis, patients were categorized into two groups based on statin use: **Atorvastatin (n=22)** and **Rosuvastatin (n=25)**. We assessed descriptive statistics: mean age, mean LDL-C levels, and estimated 10-year ASCVD risk. Visual representations include a pie chart comparing drug usage, and a box-and-whisker plot showing age distribution across statin groups.