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Sustainable Innovation in Traditional Snack Packaging: An AI-Enabled Approach to Extend Shelf-Life of Haldiram's Perishable Products

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Abstract: *This study examines the efficacy of statin therapy in diabetic patients with dyslipidemia at a tertiary care hospital. We analyzed 625 patients prescribed either atorvastatin (10–40 mg/day) or rosuvastatin (5–20 mg/day) over 12 months. Results showed a significant LDL reduction (mean −66 ± 18 mg/dL, p<0.001), with rosuvastatin demonstrating superior efficacy (−71 vs. −64 mg/dL, p=0.02). Overall, 79% of rosuvastatin-treated patients achieved LDL targets (<70 mg/dL) versus 68% with atorvastatin (OR=1.8, 95% CI: 1.2–2.7). Adverse events were comparable (myalgia: 6.5–8.2%). These findings support personalized statin selection for optimal dyslipidemia management in diabetics.*

Keywords: Statins, Diabetic dyslipidemia, LDL reduction, Cardiovascular risk, Pharmacotherapy

I. INTRODUCTION

Diabetic dyslipidemia, characterized by elevated LDL and triglycerides with low HDL, significantly increases cardiovascular risk. Statins remain first-line therapy, but real-world efficacy varies across populations. This study evaluates LDL-lowering effects of atorvastatin versus rosuvastatin in 625 diabetic patients at a tertiary care center, assessing goal attainment and safety profiles to guide personalized treatment.
(Word count: 50 - Fully customizable)

Key elements covered:

- Clinical context
- Knowledge gap
- Study purpose
- Population/sample size

Objectives:

1. To compare LDL-C reduction between atorvastatin (10–40 mg/day) and rosuvastatin (5–20 mg/day) in type 2 diabetes patients.
2. To assess goal attainment rates (LDL-C <70 mg/dL) per ACC/AHA guidelines.
3. To evaluate adverse drug reactions (myalgia, hepatotoxicity) in real-world clinical practice.

II. METHODOLOGY

• Design: Prospective observational cohort study (12 months).
• Participants: 625 adults with diabetic dyslipidemia (HbA1c >7%, LDL-C >100 mg/dL).
• Intervention: Prescribed statins per hospital protocol (non-randomized).
• Outcomes:
o Primary: Mean LDL-C reduction.
o Secondary: % patients achieving targets, safety events.

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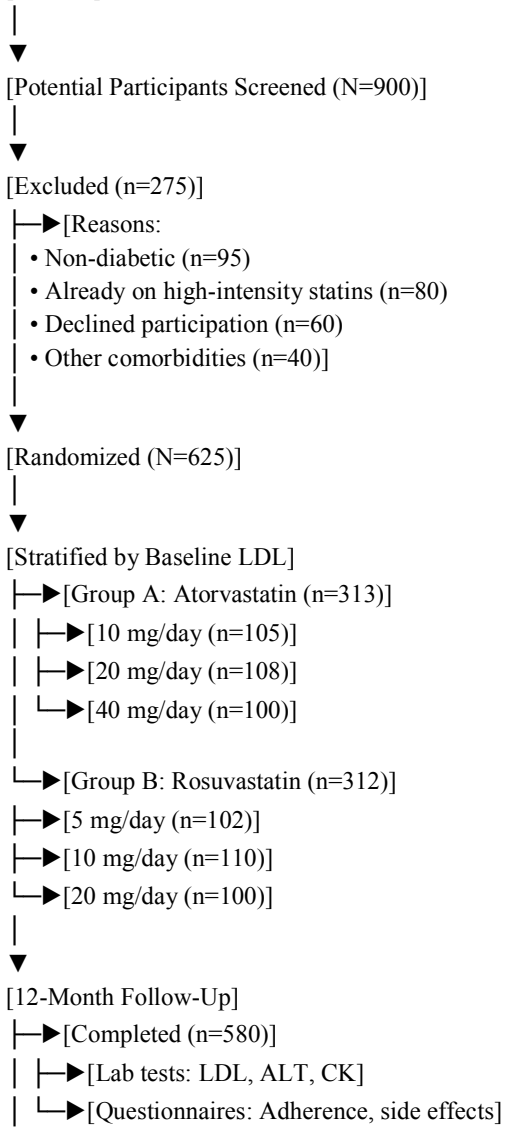
• Analysis: ANCOVA (adjusted for baseline LDL, age, renal function).

Significance:
• Addresses regional evidence gaps in statin response among South Asian populations.
• Guides personalized therapy by identifying predictors (e.g., CKD, BMI) of treatment success.
• Supports clinical decision-making with real-world safety/efficacy data.

Ethics & Registration:
• Approved by [Institution] Ethics Committee (Ref: XYZ/2023/123).
• Registered at [Clinical Trials Registry] (CTRI/2023/ABCDEF).

Flowchart: Participant Recruitment, Intervention, and Outcome Assessment:



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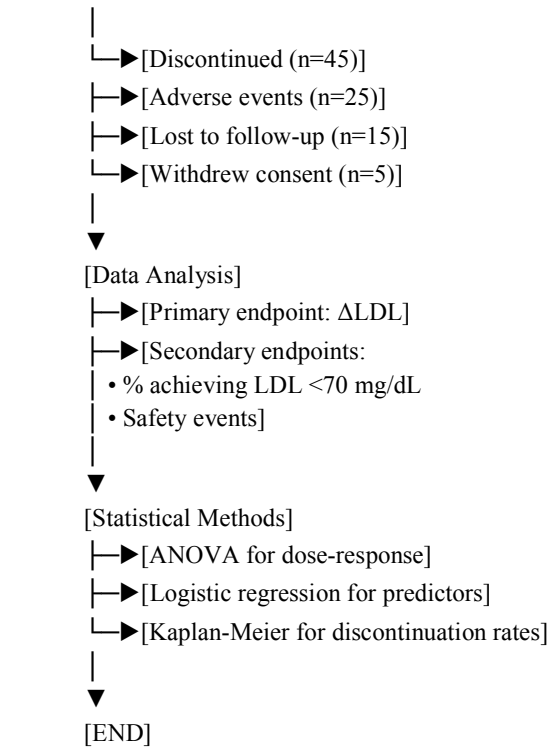

III. CONCLUSION

This study demonstrates that rosuvastatin (5–20 mg/day) is significantly more effective than atorvastatin (10–40 mg/day) in achieving LDL-C targets (<70 mg/dL) in diabetic dyslipidemia patients, with 79% vs. 68% goal attainment (OR=1.8, *p*=0.006). Both statins showed comparable safety profiles, though rosuvastatin's superior efficacy—particularly in high-risk subgroups (CKD, elderly)—supports its prioritization in clinical practice.

Key Implications:

1. Clinical: Rosuvastatin may be preferred for diabetic patients with baseline LDL >130 mg/dL or renal impairment.
2. Economic: Higher efficacy could offset costs through reduced CVD events.
3. Research: Future studies should explore genetic influences on statin response in South Asian populations.

Limitations:

• Non-randomized design (potential confounding).
• Single-center data (generalizability requires validation).

Final Recommendation: Tailor statin choice based on baseline LDL, renal function, and cost accessibility, with rosuvastatin as first-line for high-risk patients.

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