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Medical Bulletin

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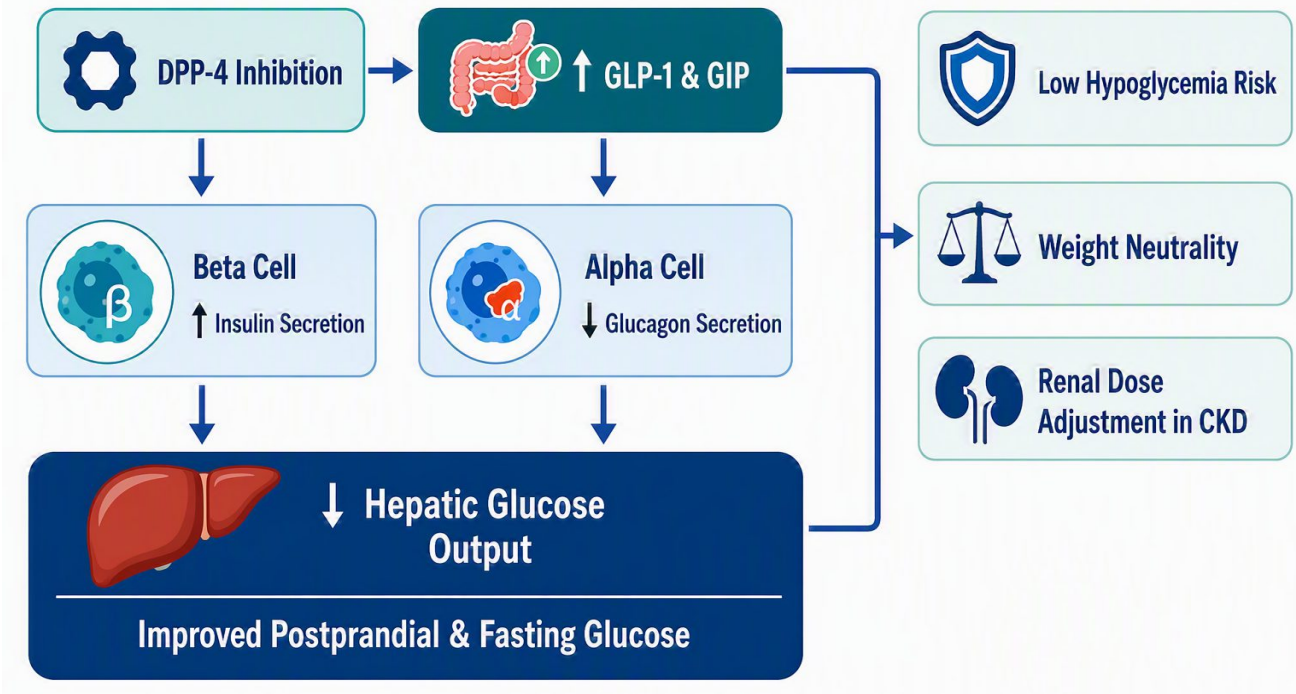
VILDAGLIPTIN: CLINICAL UTILITY, SAFETY, AND USE IN TYPE 2 DIABETES MELLITUS

Vildagliptin is a potent and selective **dipeptidyl peptidase-4 (DPP-4) inhibitor** used in the management of **type 2 diabetes mellitus (T2DM)**, particularly when a weight-neutral, low hypoglycemia-risk oral option is preferred. By enhancing endogenous incretin activity, it improves glucose-dependent insulin secretion and suppresses glucagon release. The current evidence base supports its glycemic efficacy, tolerability in renal impairment with dose adjustment, and reassuring cardiovascular safety profile.

Mechanism of Action

Vildagliptin inhibits DPP-4, the enzyme responsible for degrading glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP). This increases active incretin levels, leading to improved glucose-dependent insulin secretion, reduced glucagon secretion, enhanced β-cell responsiveness, lower hepatic glucose production, a low risk of hypoglycemia, and weight neutrality.



Vildagliptin mechanism of action and key clinical effects

Clinical Efficacy and Glycemic Benefits

Vildagliptin has demonstrated sustained glycemic control over long-term treatment, improved β-cell function & reduced glycemic variability. These efficacy findings support the use of vildagliptin in patients who require durable glycemic control while minimizing the risk of hypoglycemia.

Hypoglycaemia Risk Profile

Its glucose-dependent mechanism results in a significantly lower risk of hypoglycemia than sulfonylureas, which is especially important in elderly patients, patients with chronic kidney disease (CKD), and patients with cardiovascular disease.

Body Weight Neutrality

Unlike sulfonylureas or insulin, vildagliptin is not associated with clinically significant weight gain. Its weight-neutral profile makes it suitable for overweight or obese patients with T2DM.

Renal Use and Dose Adjustment

Vildagliptin has been evaluated in patients with renal impairment, including diabetic kidney disease, where available evidence supports glycemic benefit and acceptable tolerability, when renal dose adjustment is applied. In patients with eGFR <50 mL/min/1.73 m², once-daily dosing is recommended. Clinical studies in moderate to severe CKD and diabetic kidney disease have reported HbA1c reduction and good tolerability; therefore, vildagliptin may be considered when appropriately dose-adjusted and clinically monitored.

Cardiovascular Safety

Cardiovascular safety data for vildagliptin are reassuring, with available analyses showing no signal for increased major adverse cardiovascular events. Meta-analyses involving more than 17,000 patients have shown no increase in major adverse cardiovascular events (MACE), myocardial infarction, stroke, or cardiovascular mortality. Vildagliptin therefore remains an appropriate option for patients with established cardiovascular disease, when individualized glycemic control is required.

Clinical Pearls: When to Consider Vildagliptin

- HbA1c above target despite metformin
- Elderly T2DM patient
- CKD patient
- Individuals at risk for hypoglycemia
- Patients concerned about weight gain

Summary

Vildagliptin remains a well-established DPP-4 inhibitor with clinically relevant efficacy and safety data. Key clinical takeaways include:

1. Provides HbA1c reductions of approximately 0.7-1.3%.
2. Low risk of hypoglycemia.
3. Offers weight neutrality.
4. Can be safely used in elderly patients.
5. Demonstrates reassuring cardiovascular safety.
6. Can be safely used in CKD with dose adjustment to 50 mg once daily when eGFR <50 mL/min.
7. Recent studies continue to support its role in reducing glycemic variability and improving overall glycemic control.

Source: *Mima A, et.al,In Vivo. 2024 Jul-Aug;38(4):1; Kong D, et.al,Front. Endocrinol.829-1833*

ROSUVASTATIN IN CLINICAL PRACTICE: HIGH POTENCY, PROVEN OUTCOMES, AND BEYOND LDL-C REDUCTION

Introduction

Rosuvastatin remains one of the most potent statins available and continues to be a cornerstone therapy for the prevention and treatment of atherosclerotic cardiovascular disease (ASCVD). Its strong LDL-C lowering efficacy, favorable pharmacokinetic profile, anti-inflammatory actions, and robust cardiovascular outcomes data have secured its place in lipid management guidelines.

Recent evidence continues to reinforce the role of rosuvastatin not only in achieving lipid targets but also in improving cardiovascular outcomes, stabilizing atherosclerotic plaque, reducing vascular inflammation, and potentially favorably influencing post-myocardial infarction ventricular remodelling.

Rosuvastatin Lipid Effects

Parameter	Mean Change
LDL-C	↓ 45–63%
Non-HDL-C	↓ 40–55%
ApoB	↓ 35–55%
Triglycerides	↓ 15–30%

Evidence-Based Clinical Benefits

1. Primary Prevention

The landmark JUPITER trial established rosuvastatin 20 mg as an effective therapy in apparently healthy individuals with elevated hs-CRP and normal LDL-C levels. Treatment resulted in a significant reduction in major cardiovascular events and demonstrated the importance of addressing residual inflammatory risk along with cholesterol lowering.

Patients with diabetes, metabolic syndrome, elevated hs-CRP, multiple cardiovascular risk factors often derive substantial benefit even when LDL-C levels appear acceptable.

2. Secondary Prevention

Rosuvastatin is strongly recommended in: Coronary artery disease, Acute coronary syndrome, Ischemic stroke/TIA, Peripheral artery disease, Familial hypercholesterolemia.

Current guidelines advocate achieving: LDL-C <55 mg/dL in very-high-risk ASCVD patients, ≥50% reduction from baseline LDL-C. Rosuvastatin 20-40 mg is among the preferred high-intensity therapies to attain these goals.

3. Rosuvastatin and Coronary Plaque Stabilization

Beyond lipid lowering, rosuvastatin demonstrates reduction in vascular inflammation, improvement in endothelial function, stabilization of vulnerable plaques, decrease in lipid-rich necrotic core. These pleiotropic actions contribute significantly to cardiovascular risk reduction.

Emerging Evidence: Cardio protection Beyond Lipids

Recent studies suggest that intensive rosuvastatin therapy may attenuate adverse ventricular remodelling following STEMI and PCI. Beyond lipid lowering, rosuvastatin was associated with reductions in key inflammatory markers (CRP, IL-6, TNF-α, ICAM-1) and remodeling biomarkers (NT-proBNP, Galectin-3, MMP-9), alongside improvements in cardiac function parameters such as LVEF, stroke volume, and left ventricular end-systolic dimensions. Collectively, these findings reinforce the cardioprotective benefits of rosuvastatin in post-MI patients.

Rosuvastatin in Combination Therapy

Current lipid guidelines recommend early combination therapy with Ezetimibe when LDL-C goals are not achieved with statin monotherapy especially in patients with high-risk ASCVD, diabetes with ASCVD, familial hypercholesterolemia & patients needing >50% LDL-C reduction.

Special Populations

It is recommended for all diabetics ≥40 years with risk factors, established ASCVD, Chronic kidney disease. Benefits significantly outweigh the small increase in incident diabetes risk associated with statin therapy.

In CKD patients it provides effective LDL-C reduction. There is no dosage adjustment required in mild to moderate CKD patients however in severe renal impaired cases lowering the starting dose is recommended with monitoring myopathy at higher doses.

Safety Profile

Large meta-analyses of randomized statin trials continue to confirm that statins possess a highly favorable benefit-risk profile. A recent Cholesterol Treatment Trialists' collaboration analysis reaffirmed that serious adverse effects are uncommon and that cardiovascular benefits greatly outweigh risks in appropriately selected patients. The recommended monitoring is of baseline lipid profile, liver function test and follow up at 4-12 weeks.

Rosuvastatin remains central to the management of dyslipidemia and ASCVD, providing the strongest LDL-C reduction among commonly used statins, along with improvements in ApoB and non-HDL cholesterol. Strong evidence supports its use in both primary and secondary cardiovascular prevention, especially when intensive LDL-C lowering (>50%) is required. Emerging data further indicate anti-inflammatory and cardioprotective effects, including possible benefits in post-MI cardiac recovery. Early use of high intensity rosuvastatin, with timely addition of ezetimibe when required, is an effective approach to achieving lipid targets and reducing residual cardiovascular risk.

Source: *Mach F,et.al;Eur Heart J. 2024;Biasin M,et.al;Eur Heart J Acute Cardiovasc Care. 2026.*

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