

Tirzepatide Versus Long-Acting Insulin: A Systematic Review and Meta-Analysis

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Background

Tirzepatide, a dual GIP and GLP-1 receptor agonist, is a promising treatment for type 2 diabetes mellitus (T2DM). We aim to assess the efficacy and safety of Tirzepatide compared to long-acting insulin in T2DM patients.

Methods

We searched PubMed, Scopus, Cochrane, and WOS until August 15, 2024, for studies comparing Tirzepatide to long-acting insulin in T2DM. The quality of studies was assessed using the Cochrane RoB2 tool, and meta-analyses were conducted using RevMan5.4.

Results

Three RCTs with 4,301 participants were included, evaluating once-weekly Tirzepatide (5, 10 or 15mg) versus once-daily long-acting insulin. Tirzepatide significantly reduced HbA1c with mean differences of -0.89%[95%CI: -1.23, -0.54] (5mg), -1.11%[95%CI: -1.42, -0.79] (10mg),

and -1.23% [95%CI: -1.48, -0.97] (15mg). Significant weight loss was noted across doses: -8.41kg [95%CI: -10.34, -6.49] (5mg), -10.95kg [95%CI: -13.42, -8.47] (10mg), and -12.49kg [95%CI: -16.26, -8.72] (15mg). Hypoglycemia risk decreased with ORs of 0.42[95%CI: 0.20, 0.88] (5mg), 0.36[95%CI: 0.12, 1.06] (10mg), and 0.44[95%CI: 0.22, 0.88] (15mg), while vomiting risk increased (OR: 4.22[95% CI: 2.48, 7.19], 7.13[95%CI: 4.36, 11.67], 7.17[95%CI: 4.40, 11.70]) compared to long-acting insulin.

Conclusion

Tirzepatide is more effective than long-acting insulin in T2DM, improving glycemic control and reducing weight with lower hypoglycemia risk but increased gastrointestinal symptoms. Further research is needed to assess long-term outcomes and optimize dosing.

Keywords

Tirzepatide, GIP/GLP-1 receptor agonist, HbA1c, Randomized Controlled Trials (RCTs)