Glucagon-Like Peptide 1 Receptor Agonists and Chronic Lower Respiratory Disease among Type 2 Diabetes Patients: Replication and Reliability Assessment Across a Research Network

Mitch Conover[1], Yasser Albogami[2], Jill Hardin[1], Christian Reich[3], Anna Ostropolets[4], and Patrick Ryan[1]

[1]Janssen Research and Development LLC
[2]King Saud University Department of Clinical Pharmacy
[3]Real World Solutions
[4]Columbia University Department of Biomedical Informatics

March 23, 2024

Abstract

Introduction: Use observational methods to evaluate reliability of evidence generated by a study of the effect of glucagon-like peptide 1 receptor agonists (GLP-1RA) on chronic lower respiratory disease (CLRD) outcomes among type-2 diabetes mellites (T2DM) patients. **Research Design and Methods:** We independently reproduced a study comparing effects of GLP-1RA versus dipeptidyl peptidase-4 inhibitors (DPP4-i) on CLRD outcome among patients with T2DM and prior CLRD. We reproduced inputs and outputs using the original study data (national administrative claims) and evaluated robustness to alternate design/analysis decisions. To evaluate generalizability, we applied the protocol and meta-analyzed across a research network including diverse array of populations and data sources. We also produced additional analyses evaluating individual drugs within the GLP-1RA class. **Results:** We confirmed alignment of study inputs and outputs and closely reproduced effect estimates and sensitivity analyses. Adjusted effect estimates were robust to empirical calibration. Network meta-analysis confirmed original findings, but indicated weaker effects than originally published. Meta-analyzing drugs within the GLP-1RA class against DPP4-I provided some evidence that effects vary within the GLP-1RA class, indicating stronger effects for exenatide and weaker effects of dulaglutide. **Conclusions:** This study supports the reliability of the original study by 1) confirming the findings in a range of alternate databases and populations 2) demonstrating effects for multiple drugs within the GLP-1RA class, and 3) independently confirming the reproducibility original study and its findings. We propose that clinicians treating patients with T2DM and a history of CLRD consider GLP-1RA in absence of strong motivating reasons to select another therapy.

Hosted file

pds-24-0078-File001.docx available at https://authorea.com/users/758492/articles/732450-glucagon-like-peptide-1-receptor-agonists-and-chronic-lower-respiratory-disease-among-type-2-diabetes-patients-replication-and-reliability-assessment-across-a-research-network

1