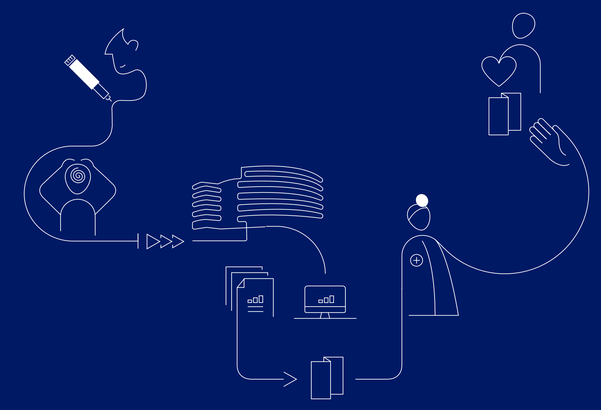
A pilot study to evaluate the feasibility of using OHDSI analytical tools for supporting safety surveillance

Ceyda Tugba Pekmez Kristiansen[1]; Lasse Christensen[1]; Michael Stellfeld[1]; Atheline-Major Pedersen[1]; Ditte Mølgaard-Nielsen[1]; Mark White[1]; Peter Jelnes[1]

https://qrco.de/bd7bvT

OHDSI analytics tools have promising potential for utilising real world data sources to support validation of safety signals.



Aim

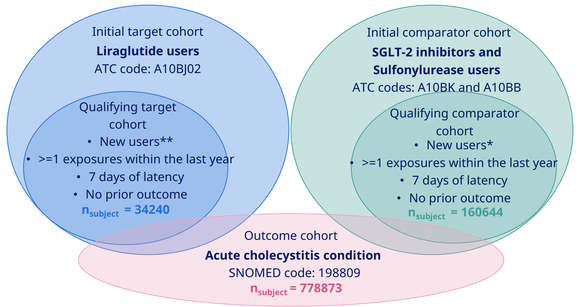
- Real world data sources (RWD) can support validation of safety topics especially when the evidence from traditional safety data sources is scarce.
- Acute cholecystitis and acute cholelithiasis are known risks for Victoza® (liraglutide) and Saxenda® (liraglutide) (1).
- A known risk for liraglutide was chosen for the pilot study to evaluate the feasibility of implementing population level effect estimation into the safety surveillance process using the OHDSI analytics tools.

Methods

- An observational new-user cohort was created for target drug exposure (liraglutide), comparator drug exposure (sulfonylureas or SGLT-2 inhibitors), and the outcome of acute cholecystitis defined by the SNOMED code 65275009.
- The study cohorts were created using Truven MarketScan employer based insurance claims data (2). Qualifying target and comparator cohort are shown in Figure 1.
- 1:3 propensity score (PS) matching was performed including age, gender, parity, body mass index, retinopathy, nephropathy, neuropathy, cardiovascular diseases, and obesity as covariates (Figure 2)
- Survival probabilities for acute cholecystitis were compared using HADES packages (3).

Key results

Figure 1: Comparative new user cohort definition



*First time use of drug within last 1 years of observation period

Figure 2: Propensity score distribution before and after the propensity score matching

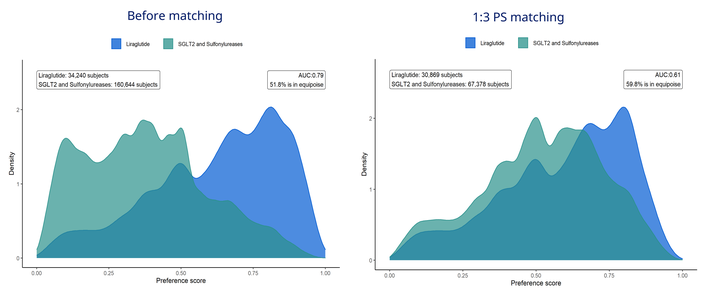
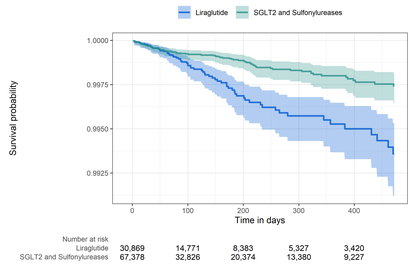


Figure 3: Survival probability and the hazard ratio

Key result



Cox-proportional HR: 2.26, CI: [1.70 – 3.03]

Minimum detectable relative risk: 1.62 ± 0.17 (SE)

CI, confidence interval; HR, hazard ratio; SE, standard error

- 30869 subjects from the target cohort were eligible for the PS matching within 0.2 standardized logit scale.
- 67378 subjects with comparative drug exposure were matched to the target drug cohort based on the propensity scores.
- 71 subjects from the target cohort and 83 subjects from the comparative cohort have had at least one condition record for acute cholecystitis.
- The prevalence of acute cholecystitis was 2.30 per 1000 subjects for the target drug cohort, and 1.23 per 1000 subjects for the comparator drug cohort.
- Survival probability of the target drug cohort diverges from the comparator drug cohort, especially after the first 100 days (Figure 3).
- The minimum detectable relative risk was 1.62 ± 0.17 (power=0.8, alpha=0.05). The target drug was associated with a higher risk of acute cholecystitis over a median three-month follow-up period (HR 2.26, 95% CI 1.70 – 3.03) (Figure 3).

Summary

- A new-user comparative cohort study was conducted to evaluate the value of implementing population level effect estimation in a RWD setting.
- The application of the OHDSI analytics tools supports a previously validated safety signal of acute cholecystitis following the exposure of liraglutide.

Conclusion

- Application of the CohortMethod R package supports a known risk of acute cholecystitis for liraglutide on a real-world data source.
- OHDSI analytics tools have promising potential for utilising real world data sources to support the validation of safety signals.
- Next steps will be a new test case for another therapeutic area including negative outcome controls and the data driven selection of covariates.

1. Nauck MA, Muus Ghorbani ML, Kreiner E, Saevereid HA, Buse JB, Investigators LPCobotLT. Effects of Liraglutide Compared With Placebo on Events of Acute Gallbladder or Biliary Disease in Patients With Type 2 Diabetes at High Risk for Cardiovascular Events in the LEADER Randomized Trial. Diabetes Care. 2019;42(10):1912-20.
2. 2. IBM® Watson Health™. Commercial Claims and Encounters Database and Medicare Supplemental and Coordination of Benefits Database IBM Marketscan Research Databases User Guide. Certain data used in this study were supplied by International Business Machines Corporation. Any analysis, interpretation, or conclusion based on these data is solely that of the authors and not International Business Machines Corporation.
3. Schuemie M, Suchard M, Ryan P. CohortMethod: New-User Cohort Method with Large Scale Propensity and Outcome Models. 2022.

[1]Novo Nordisk A/S, Global Safety, Safety Surveillance, Søborg, Denmark

Presented at the European OHDSI Symposium, 2022-06-24, Rotterdam, The Netherlands