OBJECTIVES

Low low-density lipoprotein cholesterol (LDL-C) levels and low triglyceride levels were associated with an increased risk of hemorrhagic stroke, in the Women’s Health Study. This study aims to replicate these results, in a real-world setting.

METHODS

Real-world data, comprised of electronic medical records from approximately 40 million U.S. patients were analyzed. The population was restricted to females aged 45 years of age and older, who had a lab value after Jan 1st 2000 and a second recorded lab value at least one month after the first one. LOINC codes for laboratory tests were used to define unique cohorts. The LOINC codes 12051-0 Triglyceride [Mass/volume] in Serum or Plasma by Calculation 3043-7, Triglyceride [Mass/volume] in Blood and 2571-8 Triglyceride [Mass/volume] in Serum or Plasma were used for the triglycerides cohorts. For the LDL-C cohorts, the LOINC codes 13457-7 Cholesterol in LDL [Mass/volume] in Serum or Plasma by Calculation, 49133-4 Cholesterol in LDL [Mass/volume] in Serum or Plasma by Electrophoresis, 26991-1 Cholesterol in LDL [Mass/volume] in Serum or Plasma by Direct assay and 12821-8 Cholesterol in LDL [Mass/volume] in Serum or Plasma ultrafiltrate were used.

Five cohorts with the ranges of LDL-C levels: <70 mg/dL, >70-99.9 mg/dL, >100-129.9 mg/dL (reference range), >130-159.9 mg/dL and >160 mg/dL were defined. Similarly, four cohorts for triglyceride levels were defined, with ranges: <85 mg/dL, >85-124 mg/dL, >124-188 mg/dL, and >188 mg/dL (reference range). The index event for the analysis was set as two occurrences of the same lab value range, at least a month apart, for LDL-C and also for triglycerides, with an observation period of one day to one year after the index event. The primary outcome, hemorrhagic stroke, was defined using ICD-10 diagnostic codes R16 intracranial hemorrhage and R18 subarachnoid hemorrhage. Comparisons between each cohort (with an aforementioned defined lab range) and the reference range (Ref.) were performed for the triglycerides and for the LDL-C groups.

Measures of association for each comparison, which include a risk difference, a risk ratio and an odds ratio, were calculated and propensity score matching was performed to balance co-morbidities and adjust for 9 of the most likely confounders (Table 2). Contingents that were matched on include age as index, as well as cardiovascular disease, diabetes mellitus, metabolic diseases, obesity, nicotine dependence and use of antilipemic agents (Table 2). Propensity scores were matched 1:1 using a nearest neighbor greedy matching algorithm, with a caliper of 0.25 times the standard deviation, resulting in balanced, matched cohorts (Figure 1).

RESULTS

The balanced matched cohorts, for the triglycerides and LDL-C groups were generated, with total counts of N=228,498 patients and N=154,038 patients, respectively (Figure 1).

Among women aged 45 years of age and older, patients with triglyceride levels ≤<70 mg/dL had a higher risk of hemorrhagic stroke RR (95% CI) 1.28 (1.09,1.51) compared to those with triglyceride levels >188mg/dL (ref. range) after the index event. In the same way, 10 diagnosis codes were calculated and propensity score matching (propensity score matching)

CONCLUSIONS

In this real-world analysis, the LDL-C levels and low triglyceride levels were associated with increased risk of hemorrhagic stroke, among women aged 45 years and older.

REFERENCES