EPH218

Prevalence and Incidence of Adults with Severe Hypertriglyceridaemia and High Risk of Acute Pancreatitis (≥880 mg/dL): A Systematic Literature Review and Meta-Analysis

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CONCLUSIONS

- This systematic literature review (SLR) and meta-analysis (MA) of real-world data indicates that in Europe, the United States and South America, severe hypertriglyceridaemia (sHTG, ≥880 mg/dL) has a pooled prevalence of **0.18% of adults** and a pooled incidence of **~3.6 per 10,000 person-years (PYs)**
- Heterogeneity in prevalence was considerable. Sensitivity analyses showed pooled prevalence was **robust to the exclusion of any single study** and the exploratory meta-regression indicated between-study variance was partly explained by TG threshold, region and case ascertainment
- These synthesised findings provide evidence-based epidemiological data, with quantified uncertainty, to inform **clinical and policy-level decision-making,** and highlight the need for **effective, targeted therapies** to reduce the burden of disease

INTRODUCTION

- sHTG, a lipid disorder characterised by fasting TG levels ≥880 mg/dL in the 2019 ESC/EAS guidelines,[1] is associated with an elevated risk of cardiovascular events and acute pancreatitis (AP) compared with normal TG levels[1–3]
- sHTG-related AP is often more clinically severe than AP from other aetiologies[4,5] and hospitalisation is required in most cases (irrespective of aetiology),[5] contributing to substantial healthcare utilisation and costs[6,7]
- Additionally, AP can negatively impact patient HRQoL, including abdominal pain, fatigue, emotional well-being and daily/work activities[8,9]
- The substantial burden of illness and high unmet medical need in sHTG is compounded by the limited effectiveness of conventional TG-lowering therapies, which may not lower TGs sufficiently to adequately reduce the risk of AP[10]

OBJECTIVE

- To characterise the epidemiology of sHTG (≥880 mg/dL) by conducting an SLR and MA of published real-world data

METHODS

Systematic literature review

Literature search strategy

- Electronic publication databases (MEDLINE and Embase) and conference proceedings (ACC, ADA, AACE, AHA, ESC, EAS, IAS, NLA, ISPOR) were searched on 01 April 2026. Searches were limited to studies published from 1946 for MEDLINE, 1974 for Embase, and 2023 for the conference proceedings

Study selection

- Studies were included if they reported data for adults (≥18 years) with sHTG (as defined in the publications or fasting TG ≥500 mg/dL/≥5.65 mmol/L), either as the primary population (≥80% of patients) or a discretely defined subpopulation
- Studies were eligible for this specific analysis if they reported data on individuals with TG levels ≥880 mg/dL (≥10.0 mmol/L) in Europe, North America, South America, Australia, Japan or the Middle East
- Studies were excluded if they described analyses of healthy volunteers reporting no sHTG cases, patients with FCS or drug-induced sHTG, only patients with a specific underlying condition (e.g., chronic kidney disease), case reports/series, clinical trials, narrative reviews/editorials/commentaries/letters, SLRs/(N)MAs, or pre-clinical studies

Meta-analysis

- Pooled prevalence was determined across all relevant studies using a random-effects (DerSimonian–Laird[11]) model on the Freeman–Tukey double-arcsine scale. The 95% CI reflects precision of the pooled estimate; the 95% prediction interval (PI) reflects the expected range of prevalence in a new population, given between-study heterogeneity. Cochran's Q, I^2 statistic and τ^2 were used to assess heterogeneity
- Pooled prevalence was also estimated for EU5 studies (France, Germany, Italy, Spain, UK). This prevalence estimate was further adjusted for age and sex distribution relative to the adult populations of these countries
- Pooled incidence was determined across all relevant studies using Bayesian (primary) and frequentist random-effects Poisson models
- To account for differences in TG threshold, region and case ascertainment across studies, model-adjusted prevalence was estimated via meta-regression (see 'Sensitivity analyses') to predict prevalence at TG ≥880 mg/dL for a European, survey-ascertainment population
- The male:female ratio was pooled from within-study sex-specific prevalence or incidence rate ratios (log scale; random-effects, Knapp–Hartung adjustment[12]) in the five studies reporting sex-stratified data

Sensitivity analyses

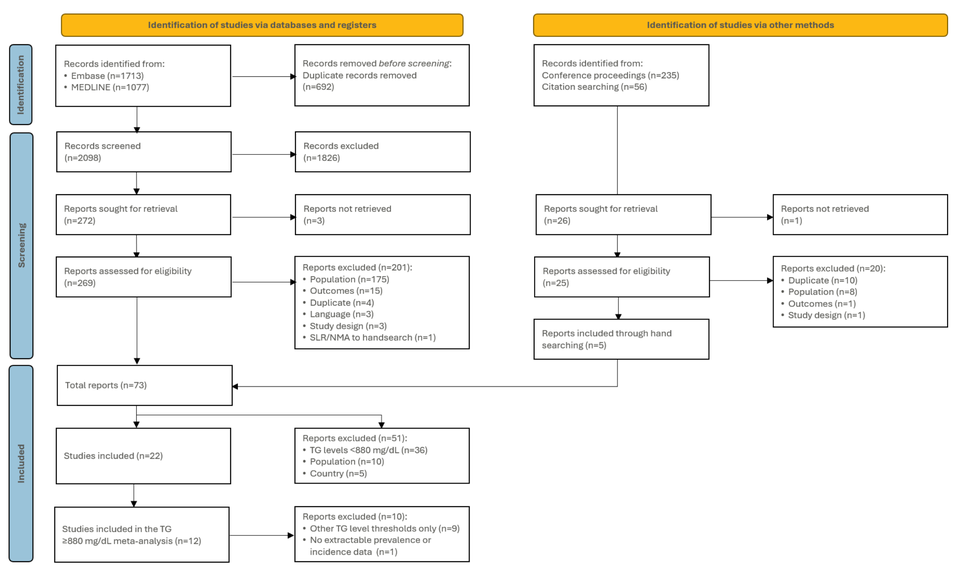
- Exploratory mixed-effects meta-regression (Knapp–Hartung adjustment[12]; permutation tests), using all 24 study-level estimates across TG thresholds (19 studies) was conducted to assess the impact of TG threshold, region and case ascertainment on pooled prevalence; R^2 is the proportional reduction in between-study variance (τ^2)
- In the 'leave-one-out' analysis, each eligible individual study was excluded to determine the influence of that study on the overall results

RESULTS

Study characteristics

- The SLR identified 2790 records; after removing duplicates, 2098 records were screened and 269 records were assessed by full-text review. Overall, 22 studies were eligible for inclusion in the MA (**Figure 1**); most were from Europe (n=11) or North America (n=7)
- Of 22 studies reporting data at single or multiple TG thresholds (≥500 to ≥2000 mg/dL), 12 reported TG ≥880 mg/dL and were included in the primary MA (11 for prevalence, one for incidence, and one reported both). The remaining 10 reported only other thresholds (n=9) or no extractable prevalence/incidence data (n=1). All 19 studies reporting prevalence at any threshold (24 estimates) contributed to the exploratory meta-regression

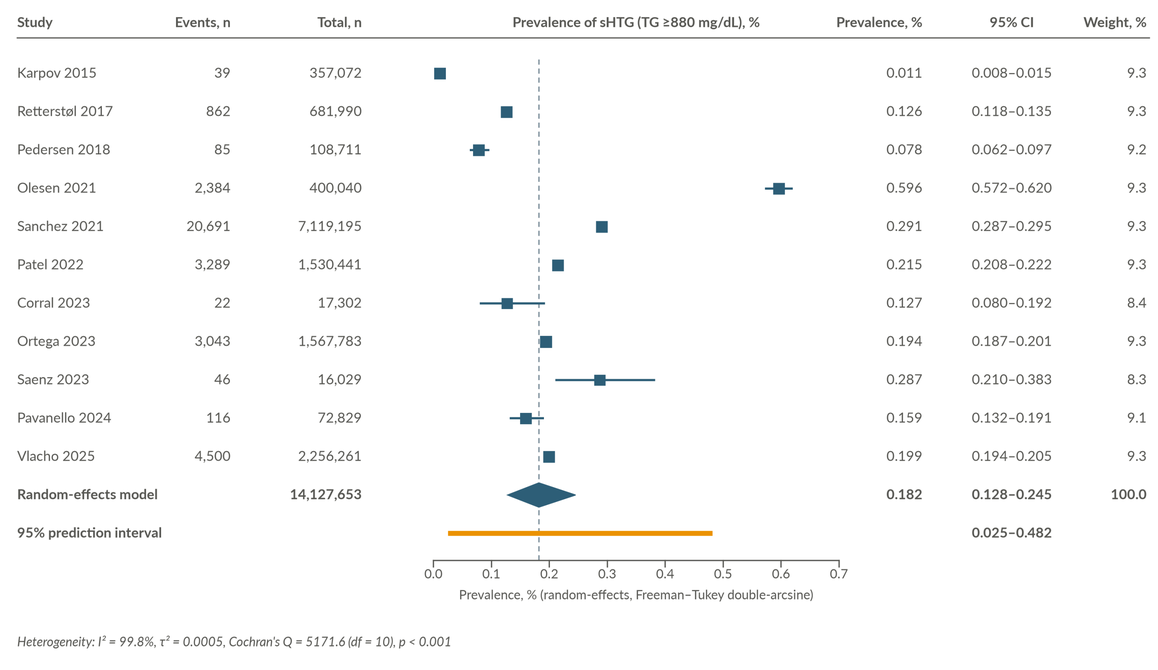
Figure 1: PRISMA flow diagram



Meta-analysis

- In the overall population, pooled prevalence for sHTG was 0.182% (95% CI 0.128–0.245; 95% PI 0.025–0.482) (**Figure 2**)
- Considerable heterogeneity in prevalence was observed between studies (Cochran's Q=5171.6, df=10, p<0.001; I^2=99.8%; τ^2=0.0005)
- Pooled prevalence in the subset of four studies from the EU5 was similar to the overall estimate: 0.198% (95% CI 0.186–0.211); age- and sex-standardisation to the EU5 adult population gave the same estimate (0.198% [range across countries, 0.195–0.204%])
- Pooled incidence rates (based on two studies) were 3.6 per 10,000 PYs (95% CrI 1.5–11.2) and 3.6 per 10,000 PYs (95% CI 3.0–4.2) estimated via Bayesian and frequentist models, respectively
- After adjusting for TG threshold, region and case ascertainment, the model-adjusted prevalence for a European, survey-based population at TG ≥880 mg/dL was 0.163% (95% CI 0.050–0.339)
- Analysis of sex (based on five studies) indicated that sHTG was almost four times more common in males than in females (pooled within-study male:female ratio of 3.78 [95% CI 3.03–4.71])

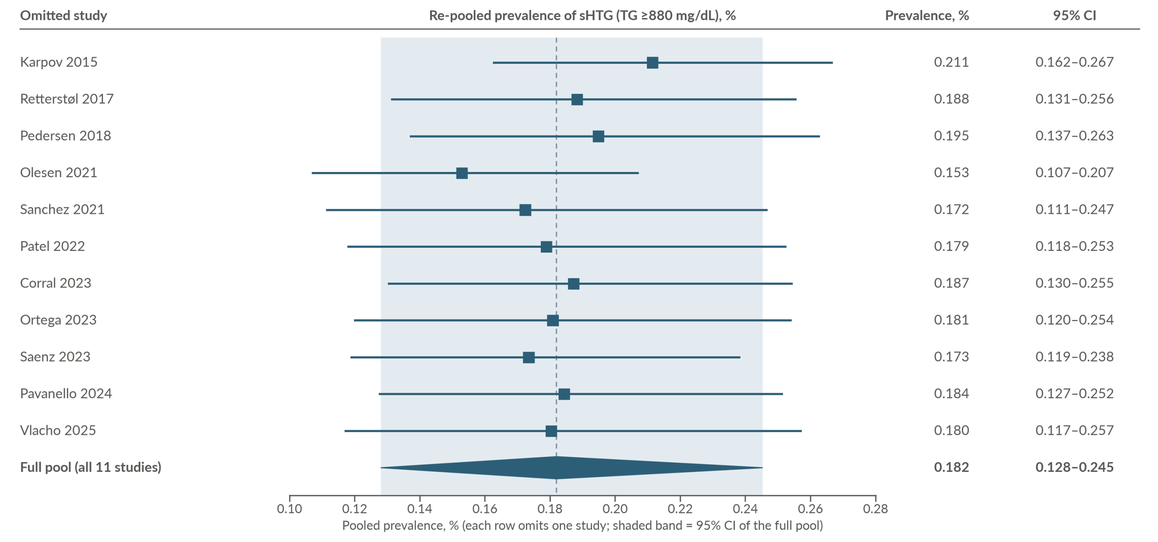
Figure 2: Forest plot of prevalence for sHTG ≥880 mg/dL



Sensitivity analyses

- Across all 24 study-level estimates (19 studies), TG threshold explained 37% of between-study variance (τ^2), rising to 52% with region and 64% with case ascertainment also added
- Excluding individual studies had minimal influence on pooled prevalence (range: 0.153–0.211%) (**Figure 3**)

Figure 3: 'Leave-one-out' analysis of prevalence for sHTG ≥880 mg/dL



Limitations

- With very large study populations, I^2 approaches 100% even when absolute differences between studies are small; it therefore indicates the presence, not the magnitude, of heterogeneity, which is better conveyed by the 95% PI. Region and case ascertainment are confounded and the meta-regression is exploratory. Incidence rates were based on two studies with annualised/reconstructed person-time. The two Spanish studies (Vlacho 2025 and Ortega 2023) represent separate studies that overlap in the data source (SIDIAP database), time period and inclusion/exclusion criteria. No French or German data were available for inclusion in the EU5 subset

Abbreviations

AACE, American Association of Clinical Endocrinology; ACC, American College of Cardiology; ADA, American Diabetes Association; AHA, American Heart Association; AP, acute pancreatitis; CI, confidence interval; CrI, credible interval; df, degrees of freedom; EAS, European Atherosclerosis Society; ESC, European Society of Cardiology; EU5, France, Germany, Italy, Spain and the United Kingdom; FCS, familial chylomicronaemia syndrome; HRQoL, health-related quality of life; IAS, International Atherosclerosis Society; ISPOR, International Society for Pharmacoeconomics and Outcomes Research; MA, meta-analysis; NLA, National Lipid Association; NMA, network meta-analysis; PI, prediction interval; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PY, person-year; sHTG, severe hypertriglyceridaemia; SIDIAP, Information System for Research in Primary Care (System d'Informació per al Desenvolupament de la Investigació en Atenció Primària); SLR, systematic literature review; TG, triglyceride; UK, United Kingdom

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Disclosures

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