INPLASY PROTOCOL

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None declared.

The impact of Triglyceride-Glucose Index on Ischemic Stroke: a systematic review and meta-analysis

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Review question / Objective: **This Systematic review, describes two issues. 1. in the general population, a high TyG index predicts the risk of ischaemic stroke (IS) P: the general population without ischaemic stroke. I: higher TyG index. C: lower TyG index. O: first ischaemic stroke occurrence. S: Observational study.**
2.In the ischaemic stroke(IS) population, a high tyg index predicts poor prognostic outcome. P: ischaemic stroke patient population. I: higher TyG index. C: lower TyG index
O: death, stroke recurrence, poor functional outcome, deterioration in neurological function. S: Observational study.
Information sources: **We searched the Cochrane Library, Embase, MEDLINE, Web of Science, PubMed, and other relevant English databases and related websites. In addition, we reviewed the references for inclusion for literature that we may not have retrieved.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 November 2022 and was last updated on 28 November 2022 (registration number INPLASY2022110145).

INTRODUCTION

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Rationale: In recent years, the impact of TyG index levels on the prognosis of IS patients has attracted considerable attention. However, current studies are still somewhat controversial. The role of TyG index on IS risk and prognosis of IS patients is contradictory, there is still few evidence systematically summarizing the role of TyG index for IS. Therefore, our present systematic review and meta-analysis aims to assess the role of TyG index for IS through investigating the relationship between TyG index and the risk of IS, and determining the effects of TyG index on clinical prognosis among patients with IS.

Condition being studied: Stroke is an acute neurologic condition that occurs due to a disruption of cerebral perfusion, resulting in focal or global neurological impairment. Strokes can be broadly classified into ischemic strokes (IS) and hemorrhagic strokes (HS). Approximately 84.4% of strokes are ischemic in origin.Annually, over 13.7 million strokes occur globally and cause 5.5 million deaths per year as well. The triglyceride-glucose (TyG) index, is a biochemical marker of insulin resistance (IR), and can be calculated as ln(fasting triglycerides (mg/dl)×fasting blood glucose (mg/dl)/2). IR is known to be a key mediator of the pathogenesis of type 2 diabetes, and thus elevated stroke risk.Recent studies have pointed to a association between the TyG index and IS, but this relationship is inconsistent. There is still little evidence to systematically summarise the role of the TyG index on Ischemic Stroke(IS).

METHODS

Participant or population: This systematic review describes two issues, one being that in the general population, a higher TyG index predicts the risk of ischaemic stroke (IS). The other is that a higher TyG index predicts a poor prognosis in a population with ischaemic stroke (IS). In describing the former question, the study population was the general population, those who did not have ischaemic strokes. In the second question, the study population was those with ischaemic stroke.

Intervention: We included all observational studies. Higher TyG index as an exposure factor. We included the population defined as having a higher TyG index in the included studies as the exposure group.

Comparator: People defined as having a lower TyG index in the included studies were used as controls.

Study designs to be included: The studies we included included cross-sectional study and cohort study.

Eligibility criteria: The inclusion criteria of the meta-analysis were as follows: 1) studies investigating the association of TyG index and the risk of IS or investigating the TyG index level with clinical outcome among patients with IS; 2) longitudinal cohort studies or cross-sectional studies; 3) adult (age >18 years) individuals of any sex or ethnicity. The exclusion criteria of the meta-analysis were as follows: 1) The study participants included only hemorrhagic stroke; 2)conference proceedings; 3) experimental, interventional studies, reviews, case reports; 4) studies with insufficiennt data; 4) non-English language studies.

Information sources: We searched the Cochrane Library, Embase, MEDLINE, Web of Science, PubMed, and other relevant English databases and related websites. In addition, we reviewed the references for inclusion for literature that we may not have retrieved.

Main outcome(s): This is the first systematic review and meta-analysis to integrate the association of the TyG index with IS risk in the general population and adverse clinical outcomes in IS patients. We found that there was a positive association between TyG index and increased risk of incident IS and this relationship remained in a stable state even as covariates changed. Meanwhile, TyG

index was significantly associated with an increased risk of stroke recurrence and mortality, though not with poor functional outcome and neurologic worsening in stroke patients.

Quality assessment / Risk of bias analysis: Appropriate scales were used for quality evaluation according to different study types. The Newcastle-Ottawa Quality Assessment Scale (NOS) was used for cohort studies (scores range from 0 to 9). Studies with a NOS score of ≥7 were considered high quality. The Agency for Healthcare Research and Quality (AHRQ) scale used for analysis of any cross-sectional study. Given that the criteria contained 11 items, we considered studies with AHRQ scores ≥8 to be of high quality.

Strategy of data synthesis: For dichotomous data, the random-effects effect size (ES) and 95% confidence intervals (CI) were calculated. Due to the heterogeneity of the included studies, we used a random-effects model to pool the data for all outcomes. Chi-square tests and I2 statistics were used to determine heterogeneity. A significant difference in a study was considered when P50%. In addition, we perform subgroup analysis and meta-regression to explore the heterogeneity of the results. We also performed sensitivity analyses to examine the stability of the results. Finally, to test the results for potential publication bias. We used the Begg's test and Egger's test to confirm whether the results were subject to publication bias.

Subgroup analysis: The subgroup analyses were performed on covariates such as study design, country, the proportion of males, mean age, sample size, study time and participants.

Sensitivity analysis: We performed a sensitivity analysis of the results using STATA 12.0 software. The software combines the results of the remaining studies after removing one study at a time. To determine if individual studies had a large impact on the results.

Country(ies) involved: China.

Keywords: The triglyceride and glucose (TyG) index; Stroke, Prevalence; Adverse outcomes.

Contributions of each author:
Author 1 - Ying Yang analyzed the original studies, screened articles, extracted the data, and ensured congruence with the inclusion and exclusion criteria. She also wrote the first draft of the manuscript.
Author 2 - Xiangting Huang analyzed the original studies, screened articles, extracted the data, and ensured congruence with the inclusion and exclusion criteria. She also wrote the manuscript.
Author 3 - Yuge Wang conducted data extraction and quality assessment. She also wrote the manuscript.
Author 4 - Lan Chen conceived and designed the study.