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Low estimated GFR predicts hemorrhagic transformation in acute ischemic stroke: A meta-analysis

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Objectives: Acute ischemic stroke (AIS) is often complicated by subsequent hemorrhagic transformation (HT). Patients with renal insufficiency have associated endothelial and platelet dysfunction and have a higher risk of bleeding. Therefore, we performed a meta-analysis to determine the relationship between renal impairment as indicated by low eGFR and HT in patients with AIS.

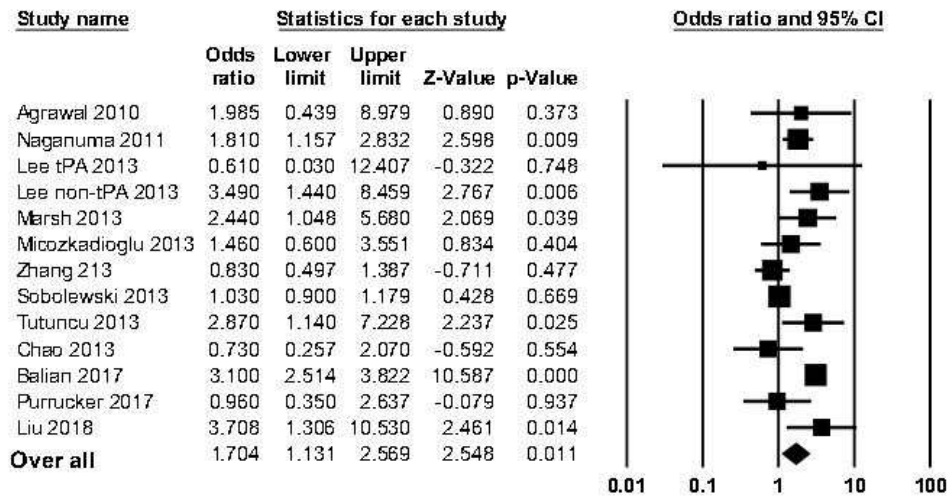
Methods: This current meta-analysis was conducted in accordance with the guidance of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Relative risk estimates of all included studies were pooled to calculate pooled OR and 95% CI.

Results: Our meta-analysis included 14 studies. Meta-analysis showed that patients with poor renal function as indicated by low eGFR had a higher risk of developing any intra cranial hemorrhage (ICH) (OR: 1.7; 95% CI: 1.13 to 2.57; $p= 0.011$) and symptomatic intra cranial hemorrhage (SICH) (OR: 1.7; 95% CI: 1.32 to 2.17; $p= 0.000$). In subgroup analysis, patients with poor renal function (eGFR < 60 and < 30) had higher risk of developing any ICH. However, this was only significant for those with eGFR < 30. There was increased risk of any ICH in both non-thrombolysed and thrombolysed patients with poor renal function albeit later was not significant. Patients with poor renal function (eGFR < 60 and < 30) had a significantly higher risk of developing SICH. Patients with poor renal function who underwent thrombolysis had a significantly higher risk of developing SICH. However, the level of significance was lost when non-thrombolysis cases were also included in the study.

Conclusions: Our meta-analysis showed that there is increased risk of any ICH and SICH in patients with impaired renal function compared to the general population. The risk is increased in patients with severe renal dysfunction (eGFR < 30) and those undergoing thrombolysis.

Forest plot

Meta Analysis(Any ICH)



Meta Analysis (SICH)

