Background: Antiplatelet therapy has established efficacy in reducing the incidence of ischaemic stroke. Stroke aetiology is heterogeneous with platelet-mediated thrombosis contributing variably to the major subtypes as defined by the TOAST criteria: large artery atherosclerosis (LAA), cardioembolic (CE), and small vessel disease (SVD). It is currently unknown what effect pre-event antiplatelet therapy has on the incidence of each subtype.

Methods: Electronic databases (MEDLINE and EMBASE) were searched for all articles comparing the effect of pre-event antiplatelet therapy on incidence of stroke according to aetiological subtype. Studies containing subjects who were prescribed anticoagulant therapy or solely investigated subjects with atrial fibrillation were excluded. Pooled odds ratios (ORs) were calculated using a fixed-effects model.

Results: Nine studies met inclusion criteria, all of which were suitable for statistical analysis (n = 5,781). Pre-event antiplatelet therapy was associated with a significantly decreased rate of LAA strokes (OR 0.88, 95% CI 0.79-0.98; p = 0.026), increased rate of CE strokes (OR 1.23, 95% CI 1.08-1.40; p = 0.003), and had no significant effect on SVD strokes (OR 0.98, 95% CI 0.87-1.11; p = 0.783). Subgroup analysis of studies investigating primary prevention populations revealed concordant non-significant trends (n = 793): LAA (OR 0.81, 95% CI 0.57-1.15; p = 0.232), CE (OR 1.27, 95% CI 0.88-1.84; p = 0.203), and SVD (OR 0.98, 95% CI 0.75-1.33; p = 0.907). Further subgroup analysis of studies examining the effect of aspirin monotherapy (n = 3,786) demonstrated a significant reduction in LAA (OR 0.87, 95% CI 0.76-1.00; p = 0.045), but non-significant effects on the incidence of CE (OR 1.17, 95% CI 0.99-1.39; p = 0.073) or SVD (OR 1.04, 95% CI 0.90-1.20; p = 0.592). In cohorts with mixed antiplatelet use (n = 1,995) there was a non-significant reduction in LAA (OR 0.90, 95% CI 0.74-1.10; p = 0.301), increase in CE (OR 1.33, 95% CI 1.07-1.64; p = 0.009) and no significant effect in SVD (OR 0.87, 95% CI 0.70-1.07; p = 0.19). There was a low probability for publication bias and non-significant heterogeneity across all analyses (p > 0.05).

Conclusions: Pre-event antiplatelet therapy preferentially reduces the incidence of LAA stroke compared to the CE and SVD subtypes.