

## Long Term Survival after a First Transient Ischemic Attack in England: A Case-Control Study

**Authors :** Padma Chutoo, Elena Kulinskaya, Ilyas Bakbergenuly, Nicholas Steel, Dmitri Pchejetski

**Abstract :** Transient ischaemic attacks (TIAs) are warning signs for future strokes. TIA patients are at increased risk of stroke and cardio-vascular events after a first episode. A majority of studies on TIA focused on the occurrence of these ancillary events after a TIA. Long-term mortality after TIA received only limited attention. We undertook this study to determine the long-term hazards of all-cause mortality following a first episode of a TIA using anonymised electronic health records (EHRs). We used a retrospective case-control study using electronic primary health care records from The Health Improvement Network (THIN) database. Patients born prior to or in year 1960, resident in England, with a first diagnosis of TIA between January 1986 and January 2017 were matched to three controls on age, sex and general medical practice. The primary outcome was all-cause mortality. The hazards of all-cause mortality were estimated using a time-varying Weibull-Cox survival model which included both scale and shape effects and a random frailty effect of GP practice. 20,633 cases and 58,634 controls were included. Cases aged 39 to 60 years at the first TIA event had the highest hazard ratio (HR) of mortality compared to matched controls (HR = 3.04, 95% CI (2.91 - 3.18)). The HRs for cases aged 61-70 years, 71-76 years and 77+ years were 1.98 (1.55 - 2.30), 1.79 (1.20 - 2.07) and 1.52 (1.15 - 1.97) compared to matched controls. Aspirin provided long-term survival benefits to cases. Cases aged 39-60 years on aspirin had HR of 0.93 (0.84 - 1.00), 0.90 (0.82 - 0.98) and 0.88 (0.80 - 0.96) at 5 years, 10 years and 15 years, respectively, compared to cases in the same age group who were not on antiplatelets. Similar beneficial effects of aspirin were observed in other age groups. There were no significant survival benefits with other antiplatelet options. No survival benefits of antiplatelet drugs were observed in controls. Our study highlights the excess long-term risk of death of TIA patients and cautions that TIA should not be treated as a benign condition. The study further recommends aspirin as the better option for secondary prevention for TIA patients compared to clopidogrel recommended by NICE guidelines. Management of risk factors and treatment strategies should be important challenges to reduce the burden of disease.

**Keywords :** dual antiplatelet therapy (DAPT), General Practice, Multiple Imputation, The Health Improvement Network(THIN), hazard ratio (HR), Weibull-Cox model

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