

P3438

Malaria infection and risk of incident heart failure: a nationwide cohort study

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Background: Malaria is a parasitic mosquito-borne infection which affects more than 219 million people worldwide each year. Recent studies have hypothesized that malaria may contribute to functional and structural changes in the myocardium, which can lead to cardiovascular disease. We therefore investigated the risk of heart failure (HF) and other cardiovascular events in individuals with a prior history of malaria infection.

Methods: Danish nationwide registries were used to identify patients with a history of malaria infection between January 1994 and January 2017. Patients with ischemic heart disease or HF at baseline were excluded. The population was sex and age matched with the general population in a ratio of 1:10. Information on cardiovascular risk factors and medication were assessed at time of the malaria diagnosis. Cox proportional hazards models, and a propensity score-matched model, were used to assess the risk of HF, myocardial infarction (MI) and cardiovascular death (CVD).

Results: A total of 3,570 malaria cases were identified (40% had plasmodium falciparum). The median age was 32 years and 57% were male.

During a median follow-up time of 11 years [interquartile range 5, 17], 52 cases experienced incident HF (1.5%), 30 MI (0.9%) and 58 suffered from CVD (1.6%). In unadjusted survival analyses, malaria cases had a significantly increased risk of HF (HR 1.34 95% CI 1.01–1.79, P=0.046) but not MI (HR 0.72 95% CI 0.51–1.03, P=0.073) or CVD (HR 1.14 95% CI 0.87–1.49, P=0.34). In multivariable models adjusted for hypertension, diabetes, chronic kidney disease, vascular disease and concomitant pharmacotherapy (lipid lowering/antianginal/diuretics/betablocker), the association with HF remained significant (HR 1.40 95% CI 1.05–1.87, P=0.023). A propensity score-matched model based on 7,152 individuals (1:1 of cases and controls) also yielded a significant association with HF (HR 1.59 95% CI 1.03–2.46, P=0.036).

Conclusion: Our data indicate that individuals with a prior history of a malaria infection may have an increased risk of incident HF but not MI or CVD. This suggests that malaria, on a hypothesis-generating basis, may affect long-term cardiac function.

