Objective To evaluate the association between migraine and cardiovascular disease, including stroke, myocardial infarction, and death due to cardiovascular disease.

Design Systematic review and meta-analysis.

Data sources Electronic databases (PubMed, Embase, Cochrane Library) and reference lists of included studies and reviews published until January 2009.

Selection criteria Case-control and cohort studies investigating the association between any migraine or specific migraine subtypes and cardiovascular disease.

Review methods Two investigators independently assessed eligibility of identified studies in a two step approach. Disagreements were resolved by consensus. Studies were grouped according to a priori categories on migraine and cardiovascular disease.

Data extraction Two investigators extracted data. Pooled relative risks and 95% confidence intervals were calculated.

Results Studies were heterogeneous for participant characteristics and definition of cardiovascular disease. Nine studies investigated the association between any migraine and ischaemic stroke (pooled relative risk 1.73, 95% confidence interval 1.31 to 2.29). Additional analyses indicated a significantly higher risk among people who had migraine with aura (2.16, 1.53 to 3.03) compared with people who had migraine without aura (1.23, 0.90 to 1.69; meta-regression for aura status P=0.02). Furthermore, results suggested a greater risk among women (2.08, 1.13 to 3.84) compared with men (1.37, 0.89 to 2.11). Age less than 45 years, smoking, and oral contraceptive use further increased the risk. Eight studies investigated the association between migraine and myocardial infarction (1.12, 0.95 to 1.32) and five between migraine and death due to cardiovascular disease (1.03, 0.79 to 1.34). Only one study investigated the association between women who had migraine with aura and myocardial infarction and death due to cardiovascular disease, showing a twofold increased risk.

Conclusion Migraine is associated with a twofold increased risk of ischaemic stroke, which is only apparent among people who have migraine with aura. Our results also suggest a higher risk among women and risk was further magnified for people with migraine who were aged less than 45, smokers, and women who used oral contraceptives. We did not find an overall association between any migraine and myocardial infarction or death due to cardiovascular disease. Too few studies are available to reliably evaluate the impact of modifying factors, such as migraine aura, on these associations.
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