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Statins for primary prevention of venous thromboembolism.
Cochrane Database of Systematic Reviews 2011, Issue 12. Art. No.: CD008203.
DOI: [10.1002/14651858.CD008203.pub2](https://doi.org/10.1002/14651858.CD008203.pub2).

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[Intervention Review]

Statins for primary prevention of venous thromboembolism

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Editorial group: Cochrane Vascular Group.

Publication status and date: New, published in Issue 12, 2011.

Citation: Li L, Sun T, Zhang P, Tian J, Yang K. Statins for primary prevention of venous thromboembolism. *Cochrane Database of Systematic Reviews* 2011, Issue 12. Art. No.: CD008203. DOI: [10.1002/14651858.CD008203.pub2](https://doi.org/10.1002/14651858.CD008203.pub2).

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ABSTRACT

Background

Venous thromboembolism (VTE) is common in clinical practice. The efficacy of statins in the primary prevention of VTE remains unproven.

Objectives

To assess the efficacy of statins in the primary prevention of VTE.

Search methods

The Cochrane Peripheral Vascular Diseases (PVD) Group searched their Specialised Register (last searched April 2011) and CENTRAL (2011, Issue 2). The authors searched MEDLINE (January 1966 to March 2011); EMBASE (1974 to March 2011); ISI Web of Knowledge (2001 to March 2011); the Chinese Biomedical Literature Database (1978 to March 2011) and other resources (including clinical trials registers, reference lists and presentations at various conferences).

Selection criteria

Randomised controlled trials (RCTs) that assessed statins were considered. The outcomes we evaluated were the rates of VTE, cardiovascular and cerebrovascular events, death and adverse events. Two authors independently selected RCTs against inclusion criteria. Disagreements were resolved by discussion with a third author.

Data collection and analysis

Data extraction was independently carried out by two authors. Disagreements were resolved by discussion with a third author. Two authors independently assessed the risk of bias according to a standard quality checklist provided by the PVD Group.

Main results

We included one RCT (17 citations) with 17,802 participants that assessed rosuvastatin for preventing VTE. Our analysis showed that rosuvastatin reduced the incidence of VTE (odds ratio (OR) 0.57, 95% confidence interval (CI) 0.37 to 0.86) and deep vein thrombosis (DVT) (OR 0.45, 95% CI 0.25 to 0.79), the risk of any (fatal and non-fatal) myocardial infarction (MI) (OR 0.45, 95% CI 0.30 to 0.69), any (fatal and non-fatal) stroke (OR 0.51, 95% CI 0.34 to 0.78), but did not reduce the incidence of pulmonary embolism (PE) (OR 0.77, 95% CI 0.41 to 1.46) and death after VTE (OR 0.50, 95% CI 0.20 to 1.24). Rosuvastatin did not reduce the incidence of any serious adverse event (OR 0.95, 95% CI 0.90 to 1.06).

Authors' conclusions

Available evidence showed that rosuvastatin was associated with a reduced incidence of VTE, but the evidence was limited to a single RCT. Randomised controlled trials of statins (including rosuvastatin) are needed to evaluate the efficacy of statins in the prevention of VTE.

PLAIN LANGUAGE SUMMARY**Statins for preventing blood clot formation within veins**

Venous thrombosis or thromboembolism (VTE) is a condition in which a blood clot (thrombus) forms in a vein and causes a blockage. The blockage most commonly occurs in the 'deep veins' of the lower legs, thighs, or pelvis, and is called deep vein thrombosis (DVT). If part or the entire clot breaks away and is carried through the blood (venous) system it is called an embolism. Should the clot reach the lungs, it is known as a pulmonary embolism (PE) and is life threatening. VTE affects about 3,705,000 people worldwide annually and is one of the most preventable causes of hospital deaths. Statins are well known cholesterol-lowering drugs that are used in heart disease. They have other protective effects including anti-clotting properties and may be effective in the prevention of VTE. Our review, based on one large randomised controlled trial (RCT) involving 17,802 participants, investigated rosuvastatin (a type of statin) for the prevention of VTE. The participants were age 50 years or older for men and 60 years or older for women, with no history of cardiovascular disease, a low density lipoprotein (LDL) cholesterol level of less than 3.4 mmol per litre) and a high-sensitivity C-reactive protein level of 2.0 mg per litre or more. Metabolic syndrome was present in 41.7% of participants. We showed that rosuvastatin could reduce the incidence of VTE, particularly VTE that occurred in the presence of cancer, recent trauma, hospitalisation, or surgery, and DVT. It did not reduce the number of cases of PE or deaths after VTE. The risk of fatal and non-fatal heart attacks combined and fatal and non-fatal strokes combined were reduced. Rosuvastatin was not associated with serious adverse events. More RCTs of statins (including rosuvastatin) are needed to evaluate the efficacy of statins in the prevention of VTE.