The most common variant associated with inherited thrombosis is Factor V Leiden G1691A variant. This variant results in resistance to activated protein C. The second most common variant associated with hereditary thrombosis is the **G20210A variant in the prothrombin (Factor II) gene. This is associated with increased plasma prothrombin levels.**

**Prothrombin G20210A** refers to a human gene mutation that increases the risk of blood clots.

The "G20210A" refers to the fact that the mutation is a guanine (G) to adenine (A) substitution at position 20210 of the DNA of the prothrombin gene. This mutation (or more accurately, single-nucleotide polymorphism or variant), is commonly associated with increased risk of occurrence and recurrence of the disease venous thromboembolism (VTE), including both deep vein thrombosis (DVT) and pulmonary embolism (PE). As of 2005, it was believed that most carriers of the mutation never develop VTE in their lifetimes. Other blood clotting pathway mutations that increase the risk of clots include factor V Leiden.

Prothrombin G20210A was identified in the 1990s, is almost exclusively present in Caucasians.\(^1\) It is estimated to have originated in that population slightly over 20,000 years ago. About 2 to 3% of Caucasians carry the variant.

Having the prothrombin mutation increases the risk of developing a DVT (Deep vein thrombosis), known as a blood clot in the deep veins, often but not always in the legs. DVTs are threatening as they can damage the veins throughout the body, causing pain and swelling, and sometimes leading to disability. Most variety of people who have this prothrombin gene mutation do not require any treatment but need to be cautious throughout periods when the possibility of getting a blood clot may be enlarged (e.g. after surgery, during long flights etc.); occasionally people with the mutation may need to go on blood thinning medication to decrease the risk of developing blood clots. As there is no cure for the mutation, studies throughout the world are becoming conversant, emitting various medications in order to decrease risk factors.
Prothrombin G20210A mutation and lower extremity peripheral arterial disease: a systematic review and meta-analysis.


Abstract

OBJECTIVE/BACKGROUND:

Despite being an important risk factor for venous thromboembolism, the role of the prothrombin G20210A mutation in patients with arterial disease remains unclear. The aim of this review was to evaluate the association of prothrombin G20210A and lower extremity peripheral arterial disease (PAD).

METHODS:

This was a systematic review and meta-analysis of case-control studies. A systematic review of electronic databases, including MEDLINE and Embase, was conducted to assess the prevalence of prothrombin G20210A in patients with lower extremity PAD. The main outcome was the prevalence of prothrombin G20210A in patients with lower extremity PAD. The random effects model odds ratio (OR) was used as the primary outcome measure.

RESULTS:

The initial electronic search identified 168 relevant abstracts of which five studies evaluating 1,524 cases of PAD and 1,553 controls were included. Prothrombin G20210A was found in 70 of 1,524 patients with lower extremity PAD and 44 of 1,553 of the controls (random effects OR 1.68, 95% confidence interval [CI] 0.8-3.2). In those with critical limb ischemia (CLI), the prevalence of prothrombin G20210A was 23 of 302 compared with 31 of 1,253 of the controls (OR 3.2, 95% CI 1.6-6.1).

CONCLUSION:

Despite finding no significant association between lower extremity PAD and prothrombin G20210A, the meta-analysis suggests that the prevalence of prothrombin G20210A is significantly elevated in those with atherosclerotic occlusive disease of the lower extremities presenting with CLI. Well-designed prospective cohort studies evaluating the role of prothrombin G20210A as a predictor of disease progression or adverse vascular events are highly needed.