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Women with poor physical fitness display significantly higher platelet activation than women with average to very good fitness. That is the major finding of a study of 62 young women, conducted by the research groups of Ivo Volf (MedUni Vienna Institute for Physiology) and Rochus Pokan (University of Vienna Institute for Sports Sciences) and sponsored by the Austrian Heart Foundation. Platelet (thrombocyte) activation can lead to the formation of potentially life-threatening blood clots. These blood clots can block blood vessels (thrombosis) and cut off the blood supply to organs.

The findings from this study have been published in the leading international journal *Medicine & Science in Sports & Exercise*. At the same time, however, the researchers were able to show that this platelet function normalized very quickly as a result of increased fitness – this was achieved by endurance training (running for a maximum of 40 minutes) just three times a week over the two-month period.

Cardiovascular diseases and their acute forms of heart attack and stroke are the commonest causes of death throughout the world. These diseases develop over several decades and are favoured by several risk factors that have a negative impact upon the function of various target cells. Activation of blood platelets can cause clumping of these cells and hence the formation of a thrombus (clot), which impedes blood flow. Activated platelets are also involved in inflammatory processes. For this reason, excessive platelet activation can also encourage inflammatory processes, which can bring about a rapid deterioration of the clinical picture in patients with cardiovascular diseases.

However, the results of the study show that even moderate training can bring about significant improvements within a comparatively short time – so that platelet activation parameters approximate to those found in the two fitter groups of volunteers.

Better assessment of the preventive effect of training

The study's lead author Stefan Heber: "Latently activated platelets release a number of mediators that can encourage the development of atherosclerotic vascular changes. If poor physical fitness is accompanied by a higher level of platelet activation, one can conclude that it also has an influence upon the early stages of this pathogenesis. The training effects we've found here are consistent with epidemiological data, according to which fit people have an approximately 40% lower risk of cardiovascular events than those who were physically inactive."

These findings could therefore be very helpful in assessing the preventive effect of different training methods and/or intensities: "Platelet-based studies could open up significant new possibilities for the direct and short-term comparison of the effectiveness of various training programmes in the field of cardiovascular disease prevention," says research group leader Ivo Volf.

More information: Correlation between Cardiorespiratory Fitness and Platelet Function in Healthy Women. Med Sci Sports Exerc. 2016 Feb 24. [Epub ahead of print] www.ncbi.nlm.nih.gov/pubmed/26909532

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