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Chapter

Introductory Chapter: Atherosclerosis, Arteriosclerosis, and Arteriolosclerosis

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1. Background

Atherosclerosis (ATS) is still a great worldwide enemy despite the reduction of deaths due to it in the last two decades. Especially in Western countries, mortality was reduced thanks to anti-smoking laws. It is well established that smoking habits may accelerate ATS injury. Unfortunately, ATS morbidity and mortality are still high. Nowadays, the major cardiovascular (CV) risk (CVR) factors contributing to ATS are "metabolic": dyslipidemia, diabetes, and metabolic syndrome. That said, we understand how global CV disease (CVD) still determines about 30% of world deaths and ATS is definitely a pivotal contributor of CVD. For this reason, in literature, we have a multitude of papers about ATS.

2. General considerations

Let us summarize what is ATS: the term atherosclerosis refers to a generic hardening and loss of elasticity of the walls of the arteries for the formation of plaques, called atheromas or atherosclerotic plaques. Initially, they made up of lipids, including cholesterol, present in the blood and over time they tend to become getting bigger until developing a sort of "support structure" also composed of fibrous substances and connective cells. The latter, in the most advanced stage of the disease, calcify and degenerate going toward necrosis.

ATS can develop over the decades in silence, without giving any symptoms. When the first signs appear, generally after 40 years of age, the situation of the arteries is usually already compromised and the risk of complications, even serious ones, becomes very high.

ATS is often considered an exclusively cardiac problem, when in fact it can affect the arteries in any area of the body.

Normally ATS does not give symptoms until an artery is so narrowed or obstructed. Then, it would no longer be able to supply organs and tissues with an adequate blood flow. In these cases, you can witness manifestations similar to those of a myocardial infarction and/or stroke.

3. Treatment

Treatment of ATS involves, first of all, lifestyle correction (low-calorie and low-saturated fatty acid diet, exercise, smoking cessation), and pharmacological

treatment of concomitant cardiovascular risk factors such as high blood pressure and diabetes mellitus. In some cases, when required by the guidelines, i.e., in secondary prevention and primary prevention in subjects with high cardiovascular risk, it is possible to resort to drugs that interact with the metabolism of cholesterol, such as statins, fenofibrates, or inhibitors of absorption cholesterol.

In selected cases and always if there are indications, it is possible to treat atherosclerotic lesions invasively with some surgical techniques. We know that angioplasty implants particular devices (stents) useful for keeping the lumen of the vessel dilated over time; the bypass that uses a blood vessel taken from another area of the body or implants a synthetic tube to allow blood to get around the artery and continue to flow. Furthermore, in case of thrombus, it is possible to implement a therapy that consists of injecting an anticoagulant drug into the affected tract to dissolve the thrombus and promote the outflow of blood.

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