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Perspective

Wood Leg Syndrome

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Let's start with some physiopathology data

The clinical picture resulting from impaired blood supply to the lower limbs is generally attributable to a vascular alteration.

The decrease in blood flow may result from an organic obstruction of the vessels (obliterating arteropathies) and/or from an alteration of the vasomotor tone with consequent vasoconstriction or vasodilation (functional arteropathies).

Atherosclerosis is the most common cause of obliterating arterial disease, in addition to numerous other environmental, biochemical, psychological, genetic risk factors and excess food intake.

Regardless of the etiology, once the arterial organic lesion has occurred, the physiological events are the same in all types of obliterating arterial disease.

According to the Hagen-Poiseuille law, the amount of blood flow is directly proportional to the pressure difference (Δ P) existing between the two points of a vessel, to the fourth power of the ray (r^4) and inversely proportional to the viscosity (η) and to the length (l) of the vessel

$$Q = \frac{K \Delta P \pi r^4}{8 \ l \ \eta}$$

In arteropathies the "primum movens" is given by the reduction of the vessel diameter (l), consequent to the organic lesion which involves a decrease in the blood flow (Q) and therefore a tissue ischemia.

This ischemia is further aggravated by the simultaneous presence of two factors:

- Blood hypercosis;
- Vasospasm (with further reduction of r).

In fact, the acid-tissue environment, which is created in the state of insufficient perfusion of the microcirculation, leads to an accumulation of Ca ions in many cells, including erythrocytes, decreasing and seriously compromising their ability to deform during the passage in the small vessels. The red blood cells, which have become rigid, are responsible for the increase in blood viscosity (η) and peripheral resistance: the latter condition only increases the pressure gradient (ΔP), necessary to maintain an optimal flow, even more, according to Poiseuille's law. Furthermore, at the level of smooth muscle fiber cells, the accumulation of calcium facilitates the onset of vasospasm, increasing sensitivity to stimuli, while in platelets it facilitates aggregation and therefore the formation of small thrombus, with subsequent release of vasoactive amines and thromboxane (TxA2).

The most characteristic symptom of the state of ischemia in a limb, even transitory, and of a functional nature, is given by the appearance of pain caused by the increase in acid substances called P substances (pain = pain), which is formed in the muscles in conditions of anaerobiosis.

The diagnosis, as well as with a detailed clinical examination of the limbs, is confirmed by an instrumental semeiology which confirms the presence of altered blood flow.

Doppler, a non-invasive ultrasound technique, allows to evaluate the speed of the blood flow in a given area.

Plethysmography is a technique that allows you to graphically record the increase in volume of a segment of a limb in relation to the flow of blood.

Rheography, a qualitative plethysmographic technique, records the variations in electrical resistance secondary to variations in blood repletion, which are graphically translated with a wave.

Arteriography is an invasive technique that ascertains the condition of the state of arterial vessels, any interruptions in them and the presence of peripheral circulation.

The problem of accidents in the bathroom, after the performance of normal bodily functions, is an increasingly frequent reality in this society populated by the elderly, especially in the age group over 70 years and in obese subjects, (the weight gain complicates the picture of the syndrome even more).

In countries in Northern Europe, in Sweden in particular, bathrooms for elderly people are equipped with hand rests in front of the toilet bowl so that the person, especially if constipated or with a lazy bowel, after sitting for a long time on the toilet, by getting up, it can resume circulation in the lower limbs, temporarily interrupted by the body weight which has compromised, even if temporarily, the circulation in the great vessels. All this allows the elderly to be able to reactivate the circulation in the limbs, remaining firmly on the handrail, without which, otherwise, they would lose their balance and fall with disastrous consequences (fractures of the limbs and pelvis). Also in Italy, a survey carried out on domestic accidents among the elderly showed a frequent presence of this problem. All this is linked to the woody legs syndrome, identified and described by the writer.

The elderly are particularly exposed to decreased muscle mass of the lower limbs, as well as of the connective tissue, subcutis and skin, which is why the vessels tend to emerge close to the skin tissue and are therefore more easily compressible. The nerve trunks compressed by the person's weight are also affected.

The diminished, even if temporary, blood flow generates, sometimes, on one, but often on both legs, acute pain, the complete loss, even if temporary, of sensitivity, of motility, as well as of the posture reflex, with consequent impossibility to assume the upright position and to maintain it, for which the individual, as soon as he tends to stand up, not supported by the muscle groups, falls. The most frequent consequences of falls in the bathroom are mostly attributed to the syndrome of woody legs, although often the cause is referred, often superficially, to slippery floors. Studies conducted on the causes of fractures in the elderly in the bathroom have established the high frequency of this domestic accident. A system is being studied by the writer to minimize the effect that this syndrome causes on the elderly.

Anti fall tab

The toilet seat should contain in its central part a slightly protruding air chamber in which a flow of air should circulate so that the parts of the legs that rest on the seat are placed on an air cushion, remain raised and the blood vessels are not permanently compressed. This allows the blood to circulate better and the nerves not to be compressed.

All this was experienced by the author of the discovery and description of the woody legs syndrome by placing a small air chamber under the legs of the subject who rests on the toilet seat.