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## Press release

### Cardiometabolic risk: diagnosis and therapy for preventing early aging

Brescia, 15 January 2015 – Identification of patients at risk, diagnostic exams that allow for assessing organ damage and providing prompt treatment. These are the main tools for combating high blood pressure, the most frequent cardiovascular risk factor that can be corrected with treatment, and is a condition often associated with other metabolic risk factors such as dyslipidemia, glucose metabolism alterations and diabetes, which is frequently linked to obesity, hyperuricemia and a sedentary lifestyle.

“High blood pressure is one of the most serious cardiovascular risks. Cardiovascular events like infarction and stroke are preceded by alterations in various target organs. Initially, these alterations are without symptoms in many cases but later on become the real cause of the disease. Therefore, it is necessary to intervene on this organ damage in order to prevent it developing or continuing”, explains **Enrico Agabiti Rosei, Director of the Department of Clinical and Experimental Science of the University of Brescia and Chairman of the International Symposium entitled “Management of cardiometabolic risk and healthy aging” organised by the Department of Clinical and Experimental Science of the University of Brescia and sponsored by the Fondazione Internazionale Menarini.**

High blood pressure causes a pressure overload on the left ventricle of the heart which gives rise to hypertrophy, that is, an increase in the muscle mass of the ventricle resulting in possible damage to the heart. For this reason, a check-up is recommended in all subjects with high blood pressure in order to detect any risk of heart disorders.

“Among all the tests available, electrocardiography is the one that costs less, however it also is less effective in identifying hypertrophy of the left ventricle”, continues Agabiti Rosei. “While CMR allows for viewing the heart in 3D with a high resolution, it is not widely used and is also very expensive. Echocardiography is certainly a valid method for identifying hypertrophy and is available in numerous hospitals at a relatively low cost. Its main limitation is the poor resolution of the images compared to magnetic resonance, nevertheless, with the creation of new programmes for 3D viewing, echocardiography could have promising developments in the future. Today however, standard echocardiography is the most widely used exam for assessing the structure of the left ventricle in patients with high blood pressure”.

Another method for detecting the damage caused by high blood pressure entails the study of the larger gauge arteries that progressively lose their elasticity, and also the small arteries and the capillary network. In fact, **high blood pressure causes alterations to the microcirculation, mainly giving rise to an increase in the thickness of the vessel walls and a reduction in the internal diameter of the small arteries**, and these alterations are powerful predictors of cardiovascular incidents.

“The microcirculation is the part of the blood circulation consisting of very small-gauge vessels (less than 300 microns), responsible not only for distributing blood to the most important organs, but also for organ resistance to the blood flow”, explains Ababiti Rosei. “It is therefore the seat of circulation alterations that also influence the circulation of the larger arteries”. In several studies the assessment of the structure of the small arteries has been carried out by means of an extremely precise and reliable technique called micromyography, only used in a very few research laboratories worldwide, in which the small vessels are dissected and isolated by means of tissue biopsies and subjected to morphological measurements and an evaluation of the functional responses. The micromyography technique has made it possible to detect the reduction of the small arteries in subjects with high blood pressure and to confirm how pharmacological and clinical treatments can reverse this process. Not to be overlooked however, the importance of also changing one’s lifestyle.

“A conspicuous weight loss in patients with severe obesity has a significant impact not only on hemodynamic alterations (dyslipidemia, insulin-resistance), but also on early organ damage, and in particular, on the alterations to the structure of the microcirculation”, adds Agabiti Rosei. “Weight loss is associated with a considerable improvement in the structural vascular alterations in the small subcutaneous arteries, as well as in the indices of circulatory oxidative stress. In fact, obesity is associated, *inter alia*, with a marked reduction in the structure of the walls of the small vessels and a loss in the normal function of the endothelium, that is, the layer of cells that lines the inside of the vessels. They are factors that may contribute to the increased cardiovascular risk observed in these patients”.

An analysis of the microvascular structure found in the eye may also be useful for assessing the changes in the small vessels and damage to the heart caused by high blood pressure. An analysis of the arterioles at the back of the eye via Laser Doppler Velocimetry could represent a non-invasive and easily repeatable procedure for obtaining information about the microvascular morphology of the retina and the changes caused by high blood pressure.

The risk factors, especially high blood pressure, can favour the structural and functional alterations to the small and large-gauge arteries that are all signs of early vascular aging, which in turn can be prevented and corrected with appropriate therapy. In order to obtain the best results it is necessary to carry out an accurate stratification of the global vascular risk and implement timely treatment since delayed or partial treatment only allows for obtaining modest results.

During the Symposium in Brescia much discussion was given to the new pharmaceutical products currently being studied for treating hypercholesterolemia, hyperuricemia, diabetes mellitus and high blood pressure. As regards the treatment of high blood pressure, the experts participating in the symposium stressed the validity of the combined administration of drugs, in particular an ARB with a calcium channel blocker. “Despite the widespread availability of anti-hypertensive treatments, **only 25% of Italian patients with high blood pressure actually manage to lower their pressure levels to within the norm, also because many fail to take the prescribed drugs**”, explains Agabiti Rosei. “The combination of two antihypertensive drugs simplifies treatment, reducing the number of tablets to be taken, which currently may be as many as three or four a day in medium-severe to severe cases, and this therefore improves patient compliance with the medical prescription. Even though high blood pressure may often be asymptomatic, patients with high blood pressure should not forget that an average reduction of the systolic pressure by just a few millimetres can significantly reduce the risk of mortality from ischemic heart disease and other cardiovascular events, as well as the risk of mortality from a stroke“.

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