Cardiosplenic Axis in Heart Failure (p 266)

Ismahil et al report changes in inflammatory cells in mice with chronic heart failure.

Persistent inflammation is a characteristic feature of heart failure. Indeed in humans increased levels of pro-inflammatory cytokines correlate with severity of heart failure and, in animal models, inflammation has been shown to contribute to ventricular remodeling and contractile dysfunction. However, in clinical trials cytokine antagonism has failed to provide benefits to patients. Given that cytokines are produced by, and target, immune cells, studying the behavior of these cells during chronic heart failure might provide additional insights into the condition. Ismahil and colleagues found that pro-inflammatory macrophages as well as dendritic cells are increased in the hearts of mice with chronic heart failure, while pro-inflammatory monocytes were more abundant in the blood. In addition, they also found that the spleens of the mice displayed increased numbers of dendritic cells, cytotoxic T cells and helper T cells. Strikingly, removal of the spleen reversed the remodeling and inflammation observed in the failing mouse hearts. Furthermore, when spleen cells from mice with heart failure were transferred into healthy mice, the recipient’s hearts began to fail. These results suggest that targeting specific immune cell populations in the heart and or the spleen might engender more effective therapeutic outcomes in chronic heart failure than targeting cytokines alone.

Carotid Intima-Media Thickness in Children with FH (p 307)

Children with familial hypercholesterolemia show evidence of artery thickening from a very young age, report Kusters et al.

Familial hypercholesterolemia (FH) is characterized by elevated LDL levels in the blood from birth onwards. The condition elevates the risk of atherosclerosis and cardiovascular disease later in life, but sub-clinical thickening of the carotid artery wall—indicative of atherosclerosis—has been observed in children with FH as young as 12. This early wall thickening is the basis of an ongoing safety and efficacy trial of the LDL-lowering drug rosuvastatin in children. Using ultrasound measurement of the carotid artery, Kusters and colleagues have now examined the wall, or intima-media, thickness in even younger children. They recruited 196 children with FH aged between six and 17 as well as 64 of their unaffected siblings. The ultrasounds revealed that, in general, children with FH had significantly thicker intima-media than their unaffected siblings. The ultrasonography revealed that, in general, children with FH had significantly thicker intima-media than their unaffected siblings. Furthermore, this significant difference was discernable even before the age of eight. Thus, the new report extends the findings of the previous study to younger children. It also highlights the importance of testing LDL-lowering therapies, like rosvastatin, in children of a very young age—the aim being to stop atherogenesis before it starts.

Bone marrow and critical limb ischemia (p 311)

Critical limb ischemia is associated with vascular and neuropathic changes in the bone marrow, say Teraa et al.

Critical limb ischemia (CLI) is the most advanced stage of peripheral artery disease and is associated with a high risk of amputation, and even death. CLI risk is increased by diabetes and the condition is associated with impaired growth of new blood vessels in the lower limbs, which may be due in part to the reduction in circulating progenitor cells observed in these patients. This reduction in progenitor cell levels suggests that CLI patient bone marrow—the source of circulating progenitor cells—may be dysfunctional. To examine whether CLI damages the bone marrow and how this is affected by diabetes, Teraa and colleagues took bone marrow biopsies from 33 patients with CLI, 13 of whom had diabetes, and 12 of whom did not. Their histological analyses revealed that bone marrow from CLI patients had fewer microvessels—capillaries and sinusoids—and fewer nerve terminals than that from healthy controls. However, the team saw no differences in the microvessel density or the degree of innervation between diabetic and non-diabetic CLI patients. These findings demonstrate that independent of diabetes, CLI is associated with altered bone marrow histology, and suggest such alterations may be the root cause of the diminished circulating progenitor cell numbers.

Written by Ruth Williams
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