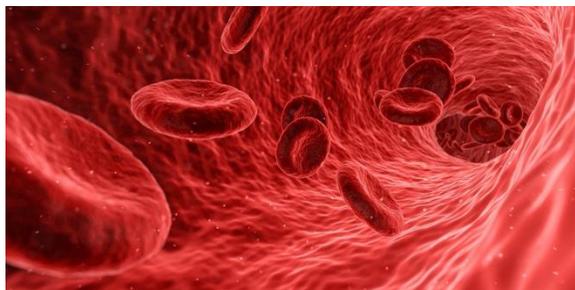


Serum Biomarkers for Early Detection of Peripheral Artery Disease



A novel panel of PAD-specific biomarkers from serum for the early detection of PAD in asymptomatic patients.

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Abstract

Peripheral artery disease (PAD), a form of atherosclerosis manifested in the lower extremities, is associated with higher risk of cardiovascular events such as myocardial infarction, stroke, and vascular death. If left untreated, patients progress to more advanced stages of PAD known as chronic limb-threatening ischemia (CLTI), which is characterized by rest pain, non-healing ischemic ulcers, and gangrene requiring limb amputation. Currently, specialized equipment based on ankle brachial index (ABI, not available in most clinical centres) and clinical symptoms (e.g. self-reported pain short distance to walk) are used together to derive a Rutherford score which is used to stage PAD – however, this approach is more subjective, variable and not convenient for routine screening and early detection of PAD.

PAD disease progression is highly variable and some CLTI amputee patients present with no PAD symptoms 6 months before onset. With a low survivorship amongst CLTI patients, there is an urgent need to understand the mechanisms of PAD progression for early detection of CLTI that also guides evidence-based treatment decisions.

McMaster researchers have developed a screening strategy that utilizes serum biomarkers that differentiate late-stage CLTI from early onset intermittent claudication (IC). This discovery may enable better risk assessment and diagnostic testing for PAD that may progress to more serious CLTI that is often diagnosed late requiring surgical intervention and amputation with poor clinical prognosis.

Applications

- Medical Applications:
 - Non-invasive screening
 - Serum biomarkers for early detection and optimal treatment monitoring
 - Enable better risk assessment and diagnostic testing for PAD

Advantages

- Non-invasive approach for early PAD detection.
- May enable more accurate diagnosis and risk assessment of PAD using a simple blood test (e.g., dried blood spot and point-of-care testing).
- Low-cost therapeutic treatment monitoring that benefits high-risk patients prone to poor clinical outcomes (i.e., death, fragility, poor quality of life) if diagnosed symptomatically.
- One advantage of the pilot study is having access to well-matched PAD sub-groups (sex, age, clinical history), including early-stage IC and late-stage CLTI without any confounding from other comorbidities, such as diabetes or renal failure.