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Perspective

Variations in Biochemical Markers in Vascular Disorders and Its Identifications

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DESCRIPTION

Biochemical markers are molecules found in blood or body fluids that can provide information about various physiological processes or disease conditions in the body. In vascular disorders, such as atherosclerosis, peripheral arterial disease, and deep vein thrombosis, several biochemical markers have been identified that can indicate the presence or severity of the condition. Vascular disorders can affect different parts of the body and can cause a range of symptoms, including changes in biochemical markers. Biochemical markers are substances in the blood or other body fluids that can be measured to provide information about the status of various physiological processes.

Common biochemical markers used

Some of the common biochemical markers used in vascular disorders include

Lipids: High levels of Low-Density Lipoprotein (LDL) cholesterol, triglycerides, and low levels of High-Density Lipoprotein (HDL) cholesterol are associated with an increased risk of atherosclerosis and other vascular disorders.

Inflammatory markers: Elevated levels of inflammatory markers such as C–Reactive Protein (CRP), Interleukin-6 (IL-6), and Tumor Necrosis Factor-Alpha (TNF-alpha) are associated with an increased risk of atherosclerosis and cardiovascular events.

Coagulation markers: Elevated levels of coagulation markers such as fibrinogen, D-dimer, and factor VIII are associated with an increased risk of deep vein thrombosis and other thrombotic events.

Endothelial markers: Markers such as von Willebrand factor (vWF), soluble E-selectin, and soluble Intercellular Adhesion Molecule-1 (sICAM-1) are associated with endothelial dysfunction, which is a key factor in the development of atherosclerosis and other vascular disorders.

C-Reactive Protein (CRP): CRP is a marker of inflammation in the body. Elevated levels of CRP are associated with an increased risk of cardiovascular events, such as heart attack and stroke.

Homocysteine: Homocysteine is an amino acid that is normally present in the blood. High levels of homocysteine are associated with an increased risk of atherosclerosis and thrombosis (blood clots).

D-dimer: D-dimer is a marker of blood clotting. Elevated levels of D-dimer are associated with an increased risk of Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE).

Fibrinogen: Fibrinogen is a protein that plays a key role in blood clotting. Elevated levels of fibrinogen are associated with an increased risk of atherosclerosis, thrombosis, and cardiovascular events.

von Willebrand Factor (vWF): vWF is a protein that is involved in the process of blood clotting. Elevated levels of vWF are associated with an increased risk of cardiovascular events, particularly in individuals with atherosclerosis.

Although biomarkers have been extensively explored, there is still disagreement over a number of topics, including definitions of standard operating procedures, the distinctiveness of processing and storage, analysis and interpretation of data, and the diagnostic usefulness of biomarkers. Finding a biomarker that is both specific and stable is essential. Due to time limits and specimen handling issues, such as the exclusion of Ribonucleic Acid (RNA) chips or the use of RNA stabilizers, it is preferable to employ stable biomarkers in ordinary clinical practice because the use of anticoagulants may produce unpredictable results. To compare the diagnostic accuracy of different laboratories around the world, large multicentric trials are required. The application of various analytical techniques has limitations. When Cerebrospinal fluid (CSF) and plasma samples are evaluated, for example, the commonly used enzyme-linked immunosorbent assay may differ from Luminex's xMAP technology, which also influences the cut off values; as a result, standardization of international standard values is necessary.

Biomarkers in body fluids need to be validated according to standardized criteria that are universally accepted for clinical diagnosis, defined as healthy controls, reproducible across many sites, and associated with accepted postmortem diagnosis.

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