Biomarkers of Coagulation Activation in HIV

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Introduction

Prothrombin fragment 1+2 (PF1+2)

- Prothrombin is a plasma protein and is synonymous with clotting factor II, playing an integral role in the coagulation cascade.
- PF1+2 is released by prothrombin during thrombin formation.
- Thrombin converts fibrinogen into fibrin and positively regulates multiple upstream factors in the coagulation cascade, enabling clot formation.
- PF1+2 is representative of thrombin production and indicative of thrombin potential.
- The anticipated positive correlation between thrombin generation and PF1+2 was not observed, suggesting that PF1+2 was implicated by the lack of correlation between microparticles and PF1+2.
- Thrombin converts fibrinogen into fibrin and positively enabling clot formation.

PF1+2 concentrations and thrombotic events, deeming the protein “one of the most useful parameters in the diagnosis of thrombosis.”

Thrombin generation occurs on the surface of phospholipid membranes following the activation of FVII by tissue factor. (1)

Platelet-derived microparticles are capable of transporting thrombosis. ”3

Thrombin activates FV, FVIII, and FXIII (fibrin), ultimately promoting clot formation.

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Total Thrombin Potential (Thrombin Generation)

- Thrombin generation occurs on the surface of phospholipid membranes following the activation of FVII by tissue factor.
- Thrombin activates FV, FVIII, and FXIII (fibrin), ultimately promoting clot formation.
- Due to the role of thrombin in the coagulation cascade, total thrombin potential has been identified as a useful gauge of both hypoagglutability and hypercoagulability.

Correlation data revealed that microparticles and PF1+2 in patient samples were independent of one another. Alternatively, these results may have arisen due to some method of inhibition that prevented the microparticles from producing PF1+2.

In patients with HIV-1, markers of thrombin generation are elevated. Alternative pathways of thrombin generation are activated via some other mechanism.

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In this population, a variety of markers may be needed to detect patients at risk for thrombosis or atherosclerotic heart disease.

References


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