Comparison of the Prothrombin Time Derived Fibrinogen and the Clauss Fibrinogen Measurement Methods and the Effects of Elevated D-dimers on these Measurements

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Abstract

Fibrinogen is an essential coagulation protein and is one of the most abundant plasma proteins. It is essential for haemostasis and abnormal concentrations or abnormal functioning of the protein can lead to haematological complications ranging from bleeding complications in cases of low concentrations to increased risk of thrombosis due to increased blood viscosity in cases of increased concentrations. Accurate measurement of fibrinogen is essential to determine potential risk for patients. Two commonly used methods are the prothrombin-time derived fibrinogen measurement (PT-F) and the Clauss assay. The Clauss assay is the gold standard method for fibrinogen measurement, that measures the concentration of fibrinogen by measuring clot formation in the presence of excess thrombin making fibrinogen the limiting reagent. The PT-F method is an indirect measure of fibrinogen based on the PT assay. This study was designed to see if the PT-F method is comparable to the Clauss assay over a range of fibrinogen concentrations and that it is an accurate rapid method for coagulation screening. D-dimers, a fibrinogen degradation product, have been identified as prognostic markers in patients with Covid-19 with higher concentrations associated with poorer prognosis. The PT-F method is known to be influenced by the presence of elevated FDPs, the dilution step in the Clauss assay reduces this interference. This study also shows that while there appears to be some influence at markedly elevated D-dimer levels on the measurement of fibrinogen, the overall effect is small.

Rachel worked as an Intern Medical Scientist in the Microbiology Department at University Hospital Galway during the COVID-19 crisis and is now working as a Medical Scientist there.