

Characterizing an Aberrant Band on Protein Electrophoresis

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For decades, one of the most widely adopted and extensively used methods to measure serum proteins in the clinical laboratory was serum protein electrophoresis (SPEP). This method involves the separation of large molecules based on size and charge across a solid matrix (agarose gel) maintained in a vertical or horizontal plane. The resolution and surface to volume ratios are low in SPEP. More recently, hospital laboratories are using capillary electrophoresis (CE) for the measurement of serum proteins mainly due to its high separation efficiency, short analysis time, low waste generation, and versatility. As opposed to SPEP, CE separates large and small molecules based on size and charge in a capillary tube. With CE, band resolution is high as well as the surface to volume ratios. While CE has many advantages as a technique, it can lead to the development of an aberrant band appearing between the beta and gamma regions. Currently, this band is being labeled as a non-specific band, even though the true identity of the band remains unknown. In this study, we identified 31 samples displaying an aberrant band between the beta and gamma regions on CE during a 6 month period. All samples were divided into two aliquots and frozen at -20 C° until subsequent analysis. One aliquot was treated with thrombin and re-assayed using capillary electrophoresis and the other aliquot was used to perform western blot. Results indicated that twenty-three of the thirty-one samples showed the presence of CRP, fibrinogen like proteins (FGLs) or fibrinogen. Fourteen samples showed the presence of CRP, twelve samples showed the presence of FGLs and five samples showed the likely presence of fibrinogen. The researchers concluded that the band identity is more related to acute phase proteins; CRP or FGL, or fibrinogen.