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Optimization of Fluorometric Measurement of Free and Total Carnitine in Serum

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Abstract: Carnitine is a major molecule which plays a great role in the transfer of long chain fatty acids into the mitochondrion. Measurement of its total and free forms is essential in the clinical evaluation of carnitine deficiency that can arise from disorders either primarily or secondarily. In this study, different deproteinization methods (precipitation with perchloric acid, heat denaturation of freeze thawing and filtration) were evaluated for the optimization of fluorometric measurement of total and free carnitine in serum. The most appropriate method for the carnitine measurement was established by additional studies of deacylation at different temperatures, pH optimization of the reaction, tests with reagents of different concentrations and intensity alteration at reaction ends. Recovery of free carnitine and octanoylcarnitine added to serum was 104-92% and 87-91%, respectively. The method was found to be very sensitive for measuring concentrations from 5 to 200 µM. In conclusion, it was observed that there was a significant correlation (r=0.977, slope:1.055, intercept:-2.59) when the optimized method was compared with the UV-kinetic method.

Key Words: Carnitine, fluorometric measurement

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