The objective of this study was to assess the feasibility of using blood spots collected by fingerpricks and dried on filter paper for measuring insulin. Blood spot testing offers advantages of convenience of sample collection at any time outside the clinical setting and simplicity of sample processing, which may allow for expanding the scope of endocrinological studies to previously unreachable subjects and study sites.

Methods: Twelve fasting and fifty non-fasting healthy subjects contributed a blood spot sample from a finger-stick and a blood sample through venipuncture. The blood spots obtained from finger sticks were air-dried at room temperature after collection and stored at -20°C within 24 hr of collection. Serum was stored frozen at -200°C. For blood spot testing, 6.4 mm discs were punched from the dried blood spots and rehydrated in assay buffer. Standards and controls for blood spots were prepared by mixing washed red blood cells 50/50 with insulin kit standards and controls and drying on blood spot filter paper. Serum and rehydrated blood spot tests were performed in parallel for insulin using the same commercial ELISA kits.

Results: A positive correlation was found in insulin levels from fasting (R² = 0.99) and non-fasting (R² = 0.93) blood spot and serum samples, respectively. The mean of fasting insulin levels were 7.3 µIU/ml (range 1.4-17.1) for serum and 7.9 µIU/ml (range 2.1-17.8) for blood spot samples. The mean of non-fasting insulin levels were 29.9 µIU/ml (range 1.8-116.19) for serum and 31.6 µIU/ml (range 1.5-143.9) for blood spots.

Conclusion: We conclude that insulin levels obtained from both fasting and non-fasting blood spot samples correlate well with values obtained from standard serum insulin assays.

References:

4. David Zava, Sanjay Kapur, Zahra M Kashi
ZRT Laboratory, Beaverton, Oregon

Abstract

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