Further Limitations of the Lipaemic Index?

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Background & Aims: It is a standard practice in many pathology laboratories to assess a sample for lipaemia to help rule out analytical interference and error; in particular pseudohyponatraemia[1]. It has been our routine practice at MMUH to reflex for sodium analysis by direct ISE where a sample's Lipaemia Index (LI) is >1 (arbitrary units). We have recently observed a phenomenon where some samples flagging above this threshold, did not flag similarly upon a repeat analysis of the lipaemic index, even when accounting for the typical variation (CV ≤ 1.7%, IQC data) observed with this measurement. This finding has prompted the present study, whose aim was to investigate this phenomenon.

Methods: Indices for Haemolysis (H), Icterus (I), Lipaemic (L) and Sodium were measured in plasma (Lithium-Heparin, Sarstedt gel) on Abbott Architect c1600 analysers. During the time period 10/12/19 – 20/01/21 we re-analysed the LI and sodium where initial analysis showed a LI >1 (n = 89).

Results & Conclusions: We recorded 51 samples with a LI >1 during the course of this study which mostly repeated lower (82/89) and predominantly (61%, 54/89) repeating to <1. For samples repeating lower, the difference [%] in LI between initial and repeat runs ranged from 0.01–1.95 [0.6-98%] (Median = 0.48,[34%]) (Figure 1). The median time interval between initial and repeat LI analysis (LI_{T2}–LI_{T1}) was 28 minutes (Range 8–207min). The mean difference between initial and repeat sodium analysis (indirect ISE) was 0.9 mmol/L (Maximal = 4mmol/L) (Figure 2). There was no correlation (r = -0.04) between the LI time interval time elapsing between the LI_{T2}-LI_{T1} time interval and either the change in LI or the change in sodium concentration.

Beyond the limitations of using LI to indicate lipaemia, e.g. poor relationship with triglyceride or protein concentration, our data highlight yet further limitations in using LIs for evaluating lipaemia. Since most LIs repeated below the reflex threshold, this may have implications for informing any additional sodium measurement by direct ISE. This is the focus of ongoing investigations together with analysis involving serum.

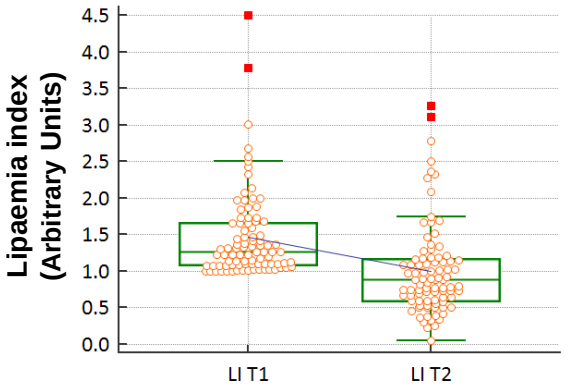

Figure 1: Median lipaemia index on initial analysis (LI_{T1}) compared to repeat analysis (LI_{T2}).

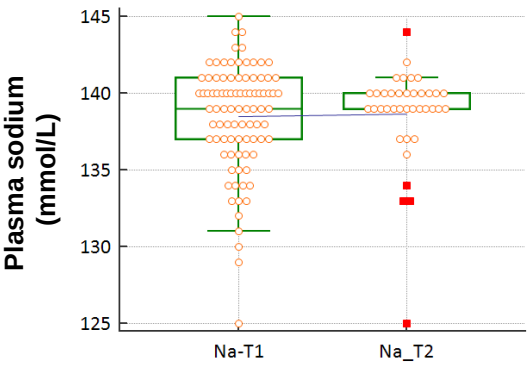

Figure 2: Median sodium result on initial analysis (NaT1) compared to repeat analysis (NaT2)

References:

1. Sahay & Rakesh (2014) Hyponatremia: A practical Approach. *Indian J Endocrinol Metab.* 18, 760 – 771.