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LETTER

Surrogate measures of insulin sensitivity vs the hyperinsulinaemic–euglycaemic clamp: a meta-analysis. Are there not some surrogate indexes lost in this story? Reply to Bastard JP, Rabasa-Lhoret R, Laville M and Disse E [letter]

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Abbreviation
HEC Hyperinsulinaemic–euglycaemic clamp

To the Editor: We agree with Dr Bastard and colleagues [1] that the variety of available tools provides an opportunity to assess different aspects of insulin sensitivity. In our extensive literature search on surrogate measures of insulin sensitivity, we found estimations of the correlation to the hyperinsulinaemic–euglycaemic clamp (HEC) for 31 indices based on fasting samples and 65 indices based on the OGTT [2].

The correlation strength between the accepted reference method, HEC, and a surrogate index is strongly influenced by the accuracy of the HEC, which varies depending on factors such as insulin dose and examination length. We therefore required a minimum of five papers for a given surrogate to be included in our review. However, the meta-analyses of the 76 surrogate measures that had been reported in fewer than five papers can be found in the electronic supplementary material linked to our original paper (ESM Table 2 for OGTT-based indices and ESM Table 3 for fasting indices) [2].

The SIisOGTT index reported by Bastard et al [1] is described in ESM Table 2 [2]. The meta-analysis for SIisOGTT was based on three articles [3–5] and resulted in a pooled correlation of 0.74 (95% CI 0.60, 0.83). The correlation strength of 0.74 was slightly higher than the other indices reported in detail in our paper. However, the confidence interval was wider compared with the Stumvoll MCR, Matsuda, Stumvoll ISI, Gutt and Revised QUICKI indices.

The meta-analysis for the Disse index based on two articles gave a pooled correlation of r=0.73 (ESM Table 3). The Avignon SiM index was reported in three papers, which amounted to a correlation of r=0.70 (ESM Table 2).

We aimed to rank the different surrogate measures found in the literature and to assess whether fasting indices can be used instead of the more time-consuming OGTT-based measures. According to our interpretation, the Revised QUICKI fasting surrogate index is as good as the OGTT-based Stumvoll MCR, OGIS, Matsuda, Stumvoll ISI and Gutt indices for estimating insulin sensitivity. However, we look forward to future studies that further examine the indices described in ESM Tables 2 and 3 in relation to the HEC.

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