

HOW TO ESTABLISH METABOLITE REFERENCE RANGES FOR HEALTHY ADULTS?

Boglárka Barna^{1,2} Violetta Koósz², Ágnes Tóth², Gábor Endre², Ildikó Thibodeau², Csaba Varga¹

¹*Department of Physiology, Anatomy, and Neuroscience, University of Szeged
Közép fasor 52., H-6726, Szeged, Hungary*

²*Medipredict Health Kft.
Irinyi József u. 4-20. B2 building, ground floor, H-1117, Budapest, Hungary
e-mail: boglarka.barna.md@gmail.com*

The main bottleneck for the clinical implementation of metabolomics is the lack of standardized reference ranges for healthy adults. A possible solution for standardization would be the use of absolute concentration data that in theory can be directly compared between laboratories. Our study aimed to investigate the variance of absolute concentration measurements between independent laboratories and to assess whether establishing standardized metabolite reference ranges to facilitate clinical implementation of metabolomics is feasible.

We have measured 50 healthy adults' (aged 18-50) metabolomics profiles by using the Biocrates MxP500 kit measured with liquid chromatography-tandem mass spectrometry. To assess the results and to try to establish a normal range based on these measurements, we have used basic data analytical tools, a bootstrapping method, and the fitting of statistical distributions. We compared our results to Trabado et al.'s study [1] which quantified a smaller number of metabolites for 800 healthy French subjects (aged 18-86).

Our results showed that none of the measured metabolites exhibited a normal distribution and they varied in a smaller range than in the previous study. This may be explained by our smaller sample size. Alternatively, it could be explained by the younger study population which may suggest that the development of metabolite reference ranges should be stratified by age.

References

1 Séverine Trabado, Abdallah Al-Salameh, Vincent Croixmarie, Perrine Masson, Emmanuelle Corruble, Bruno Fève, Romain Colle, Laurent Ripoll, Bernard Walther, Claire Boursier-Neyret, Erwan Werner, Laurent Becquemont, Philippe Chanson, The human plasma-metabolome: Reference values in 800 French healthy volunteers; impact of cholesterol, gender and age PLoS One, 2017, 12(3) e: 0173615