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Plenary lecture 3: A molecular definition of metabolic syndrome as investigated by NMR-based metabolomics, Dr. Óscar Millet

Tuesday, 26 November 2024 13:50 (50 minutes)

Metabolic syndrome (MetS) is a cluster of medical conditions and risk factors correlating with insulin resistance that, when occurring together in an individual, increase the risk of developing life hazardous cardiometabolic health problems. The specific criteria for diagnosing MetS are challenging and vary among different medical organizations but are typically based on the evaluation of abdominal obesity, high blood pressure, hyperglycemia, and dyslipidemia. In this context, an independent estimation of the risk of MetS based on quantitative biomarkers is highly desirable. We used NMR-based metabolomics on a large cohort of donors ($n=21,323$) to investigate the diagnostic value of serum or serum combined with urine to estimate the MetS risk. Specifically, we have determined a plethora of circulating metabolites and the lipoprotein composition in serum samples and this information has been integrated with metabolic profiles extracted from urine samples. We have developed MetSCORE, a metabolic model of MetS that combines serum lipoprotein and metabolite information.[1] MetSCORE discriminate MetS patients (independently identified using the WHO criterium) from general population with an AUROC of 0.91. This continuous model can quantitatively stratify risk factors according to their contribution to the development of MetS. We believe that MetSCORE may be an insightful tool for early intervention and lifestyle modifications, potentially preventing the aggravation of metabolic syndrome.

[1]Gil-Redondo, R et al. *Cardiovas. Diabetol.* 2024, 23, 272-280.

Field

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