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compared to 0.61 for Friedewald; concordance rates were 27.55% for the Martin-Hopkins, 26.78% for the Sampson-NIH and vs 24.25% for the Friedewald equation. Among people with TG 0-400 mg/dL, the proportion of misclassified individuals was 4,4% for the Sampson-NIH, 4,9% for the Martin-Hopkins and 6,4% for the Friedewald equation. Among people with TG 400-800 mg/dL, the proportion of misclassified individuals was 7,4% for the Sampson-NIH, 3,7% for the Martin-Hopkins and 14,8% for the Friedewald equation. The respective proportions were 14,7%, 14,7% and 17,6% among individuals with LDL-cholesterol $<$70mg/dL.

Conclusion

This study demonstrates that the three methods perform very well in people with TG 0-400 mg/dl, relatively good in people with TG 400-800 mg/dL and less well in people with LDL-cholesterol $<$ 70 mg/dL. However, the Sampson and Martin-Hopkins equations are less prone to therapeutic misclassification errors than the Friedewald equation.

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## EP872

**JOINT423**

**Exploration of metabolic signatures or biomarkers associated with obesity in children and adolescents**

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Introduction

Obesity is an escalating health issue globally, impacting both adults and children. Despite its prevalence, the precise mechanisms driving the development of obesity in children remain unclear. Metabolomics, the comprehensive study of metabolites within biological systems, offers a powerful approach to better define the phenotype and understanding the complex biochemical alterations associated with obesity.

Aim

The aim of our study was to summarize the current knowledge in the field of metabolomics in childhood obesity, and to identify metabolic signatures or biomarkers associated with obesity in children and adolescents (within the framework of the BIO-STREAMS project (https://www.bio-streams.eu/); a 4-year (2023–2027) Horizon Europe project (No101080718)).

Methods

We performed a systematic search of Medline and Scopus databases according to PRISMA guidelines. The review was registered in the International Prospective Register of Ongoing Systematic Reviews (PROSPERO 2023 CRD42023494461). We included only longitudinal prospective studies, randomized-controlled trials with $\geq$12-month follow up, and meta-analyses of the above that assessed the relation between metabolic signatures related to obesity and body mass index (BMI) or other measures of adiposity in children and adolescents aged 2-19 years with overweight or obesity. Initially, 595 records were identified from PubMed and 1565 from Scopus. After removing duplicates and screening for relevance, 157 reports were assessed for eligibility. From the additional search, 75 new records were retrieved, from which none was eligible for our study. Finally, 7 full-text articles were included in our study.

Results

The majority of the included studies stated an association of lipids with changes of BMI, insulin resistance and the risk for metabolic syndrome. More specifically, these include certain lipoproteins, apolipoproteins, cholesterols, fatty acids, glycerides and phospholipids, ketone bodies, lysophosphatidylcholines as well as acyl–alkyl phosphatidylcholine. Among the overarching class of amino acids, peptides and analogues, included are glycylproline, citrulline, formiminoglutamic acid, 4-hydroxyproline, alanine, phenylalanine, tyrosine, gluta-mine, methionine, serine and alanine. Furthermore, numerous lipids act as signaling molecules in inflammation pathways or insulin resistance, contributing to obesity-related complications, such as DM2 and cardiovascular disease. Acylcarnitines are the by-products of noncomplete fatty acid oxidation.

Conclusion

Our findings reveal specific biomarkers in the amino acid and lipid pathway that could serve as early indicators of obesity and its related cardiometabolic complications. Continued exploration of metabolomic profiles in childhood obesity is warranted, particularly in pediatrics, to develop targeted interventions and prevent the long-term consequences of this condition.

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## EP873

**JOINT2648**

**Comparative accuracy of glycemic parameters in identifying dysglycemia in obese indian children and adolescents**

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Background-

Dysglycemia is a significant cause of concern in children and adolescents with obesity. The beneficial impact of early intervention makes timely identification desirable. The current diagnostic cutoffs for dysglycemia based on adult recommendations have not been validated in Indian children and adolescents. In particular, the validity of hemoglobin A1C (HbA1C) cutoffs has been questioned.

Aim

To compare the diagnostic accuracy of glycemic parameters (glucose tolerance test, HBA1C, and continuous glucose monitoring measures) in identifying dysglycemia in obese Indian children and adolescents.

Methodology

An oral glucose tolerance test and HbA1C were performed in 170 obese children and adolescents (110 boys; age 12.8 $\pm$ 3.2 and BMI SDS 2.3 $\pm$ 0.6). Twenty subjects also underwent 14-day ambulatory blood glucose monitoring. The prevalence of dysglycemia according to different measures and the correlation between different parameters were compared. A ROC curve was generated to determine the diagnostic cutoff of HbA1C to identify glucose tolerance test-detected dysglycemia.

Results

Dysglycemia was identified by eight subjects according to fasting glucose (all pre-diabetes, 4.7%), fifteen as per 2-hour value (13 with prediabetes, 2 with diabetes; 8.8%), and 37 by to HbA1C (36 with pre-diabetes and 1 with diabetes, 21.8%). Twenty-eight subjects (77.8%) identified as pre-diabetes by HbA1C had normal glucose tolerance tests. Both the subjects with abnormal glucose profiles on continuous glucose monitoring (16.2%) had glucose tolerance tests determined dysglycemia. Average blood glucose in CGM data correlated with fasting ($r$ = 0.9, $P$ = 0.001) and 2-hour blood glucose ($r$ = 0.8, p=$<$0.001) with no correlation with HBA1c ($r$ = 0.5, $P$ = 0.09). The ROC curve for diagnostic efficacy of HbA1C in identifying dysglycemia had an area under the curve of 0.730 ($P$ = 0.02). An increase in HBA1C cutoff to 6% would have avoided the diagnosis of dysglycemia in 8 subjects with normal glucose tolerance tests.

Conclusion

Dysglycemia is common in Indian children and adolescents, highlighting the need for early identification. HbA1C tends to overestimate dysglycemia, suggesting the need for higher cutoffs. ABGM is a promising tool for screening dysglycemia but needs further exploration before widespread use.

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## EP874

**JOINT23**

**Screening accuracy of single-point insulin sensitivity estimator (SPISE) for metabolic syndrome: a systematic review and meta-analysis**

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Background

Metabolic syndrome (MetS) is a multifactorial condition linked to increased risk of cardiovascular disease and type 2 diabetes. Insulin resistance underpins its pathophysiology, yet traditional diagnostic methods are invasive and costly. The Single-Point Insulin Sensitivity Estimator (SPISE), a non-invasive index, offers a practical alternative for assessing insulin sensitivity. This systematic review and meta-analysis aim to evaluate the diagnostic accuracy of SPISE in detecting MetS.