

LIPID METABOLOMICS AND RESPIRATORY FUNCTION IN CHILDREN WITH MILD-ASTHMA PHENOTYPE

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Abstract

INTRODUCTION There has been a global surge in allergic disease with asthma control being sub-standard and challenging in children ^(1,2,3). Better diagnostic techniques, more effective therapeutic procedures could reduce asthma morbidity in children ⁽⁴⁾. Lipid metabolomics can be applied to identify predictive biomarkers and novel pathogenic pathways for complex chronic diseases including asthma, along with disease progression and therapeutic response ⁽⁵⁾. We investigated the correlation between plasma fatty acids (FA) and respiratory function

as biomarkers of the mild-asthma phenotype.

METHODS

- Study design: Cross-sectional
- Subjects: 64 mild-asthmatic children, 5-12 y.o
- Sex: 52% ♂, 48% ♀ (mean age: 8.0 ± 2.0 y.o)
- Recruitment: Pediatric clinic, Athens, Greece.

Assessments:

- Respiratory function-Spirometry, FeNO
- Plasma FA concentrations -GC-MS.
- Adiposity-BMI (kg/m²) ⁽⁶⁾

Statistics: Spearman's (r), P significant at 5%

RESULTS

- 25 unique plasma FA identified in mild-asthmatic children (Fig 1)
- 16 significant correlations (r) between FA & lung function:
- Negative r between linoleic, oleic, cis-11-eicosenoic, heptadecanoic, total (MUFA, PUFA, Ω6) and spirometry (FEV₁, FEV₁/FVC, PEF, FEF_{25-75%}); positive between erucic and PEF; palmitoleic, nervonic and FeNO.
- 7 significant correlations based on BMI category

- In overweight/obese group positive r for linoleic and FEV₁/FVC; palmitoleic and oleic with FeNO; and negative r with cis-11-eicosenoic and FEV₁/FVC.



CONCLUSION

Lipid metabolomics discovered new biomarkers associated adversely with pulmonary mechanics in asthmatic children. Metabolomic techniques may aid in the development of personalized prognostic, diagnostic and treatment approaches that have the potential to significantly alter pediatric asthma management.



Biography:

M M Papamichael professor at Trobe University, School of Allied Health, Melbourne, Australia.

Speaker Publications:

1. Ferrante et al, 2018. *Front Pediatr* 6, 186-186.
2. Nunes et al, 2017. *Asthma Res Pract* 3, 1.
3. Engelkes et al. 2015. *Eur Respir J* 45, 396-407.
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5. Johnson et al, 2016 *Nat Rev Mol Cell Biol* 17, 451-459.
6. Cole, 2012. *Pediatr Obes* 7, 284-294

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