



ORAL PRESENTATION

Open Access

Resistance training improves metainflammation and body composition in obese adolescents

Rachana Dahiya^{1,7*}, Sarah Shultz², John Cardinal³, Nuala Byrne⁴, Andrew Hills⁵, Kristen Gibbons⁵, Louise Conwell⁶, Mark Harris⁷, Gary Leong⁸

From 8th APPEES Biennial Scientific Meeting
Darwin, Australia. 29 October – 1 November 2014

Adolescent obesity is associated with inflammation, insulin resistance and prediabetes. The purpose of the study was to investigate whether resistance training (RT) improves the adipokine profile, body composition and insulin sensitivity of obese adolescents. Fourteen obese adolescents (16.1±1.6 y; M:F 6:8; body mass index (BMI) SDS 2.01 + 0.31) were recruited for a 16-week RT intervention. Thirty-one lean youth (15.6±1.3 y; M:F 19:12; BMI SDS -0.03±0.07) had baseline anthropometric measurements and blood tests for comparison. Participants completed 3 RT sessions per week with training load progressively increased from 60% to 85% of one repetition maximum (1-RM). The following parameters were examined pre- and post-intervention: 1) Height, weight, BMI; 2) High sensitivity C-reactive protein (hs-CRP) and adipokines including interleukin (IL)-1 β , IL-6, tumor necrosis factor-alpha (TNF- α), adiponectin, soluble intercellular adhesion molecule (sICAM)-1, leptin and resistin; 3) Body composition by dual energy x-ray absorptiometry (DXA), and 4) Insulin sensitivity by homeostatic model assessment (HOMA-IR). Obese youth had significantly higher IL-1 β , leptin and resistin (all $p < 0.0001$) and lower adiponectin and sICAM-1 (both $p < 0.0001$) at baseline compared with lean youth. Post-intervention, a reduction in IL-6 ($p < 0.01$), IL-1 β ($p < 0.01$) and resistin ($p < 0.001$) was observed whereas adiponectin and sICAM-1 increased ($p < 0.05$, $p < 0.001$ respectively) in obese adolescents. HOMA and hs-CRP remained unchanged. IL-1 β and sICAM-1 levels in obese youth normalised to levels comparable to lean youth post-intervention ($p = 0.1$ and $p = 0.2$), whereas TNF- α and resistin were significantly lower ($p < 0.05$, $p < 0.01$ respectively) post-intervention in the obese

youth. Percent fat for the trunk, arm and total body ($p < 0.05$) were reduced, while fat free mass ($p < 0.01$) was increased after the intervention. RT is a feasible intervention to improve the adipokine profile and body composition of obese adolescents suggesting it may be a feasible intervention for improving metabolic health in obese youth at high risk of Type 2 Diabetes.

Authors' details

¹School of Medicine, The University of Queensland, Herston, QLD, Australia. ²School of Sport & Exercise, College of Health, Massey University, Wellington, New Zealand. ³Pathology Queensland, Herston, Australia. ⁴Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, QLD, Australia. ⁵Mater Research - UQ, South Brisbane, QLD, Australia. ⁶Royal Children's Hospital, Brisbane, QLD, Australia. ⁷Mater Children's Hosp, South Brisbane, QLD, Australia. ⁸The University of Queensland and Mater Children's Hospital, St Lucia, QLD, Australia.

Published: 28 April 2015

doi:10.1186/1687-9856-2015-S1-O40

Cite this article as: Dahiya et al.: Resistance training improves metainflammation and body composition in obese adolescents. *International Journal of Pediatric Endocrinology* 2015 **2015**(Suppl 1):O40.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



¹School of Medicine, The University of Queensland, Herston, QLD, Australia
Full list of author information is available at the end of the article