METABOLICALLY UNHEALTHY OBESE CHILDREN UNDER THE RISK OF EXERCISE INDUCED CHRONOTROPIC INCOMPETENCE

Tetyana Chaychenko, Olena Rybka

KHARKIV NATIONAL MEDICAL UNIVERSITY, UKRAINE

HYPOTHESIS:

There is a high incidence of acute cardiovascular events in obese with lack of data concerning metabolically healthy group peculiarities.

We hypothesized that exercise tolerance is different in metabolically healthy and metabolically unhealthy obese adolescents.

POPULATION and METHODS:

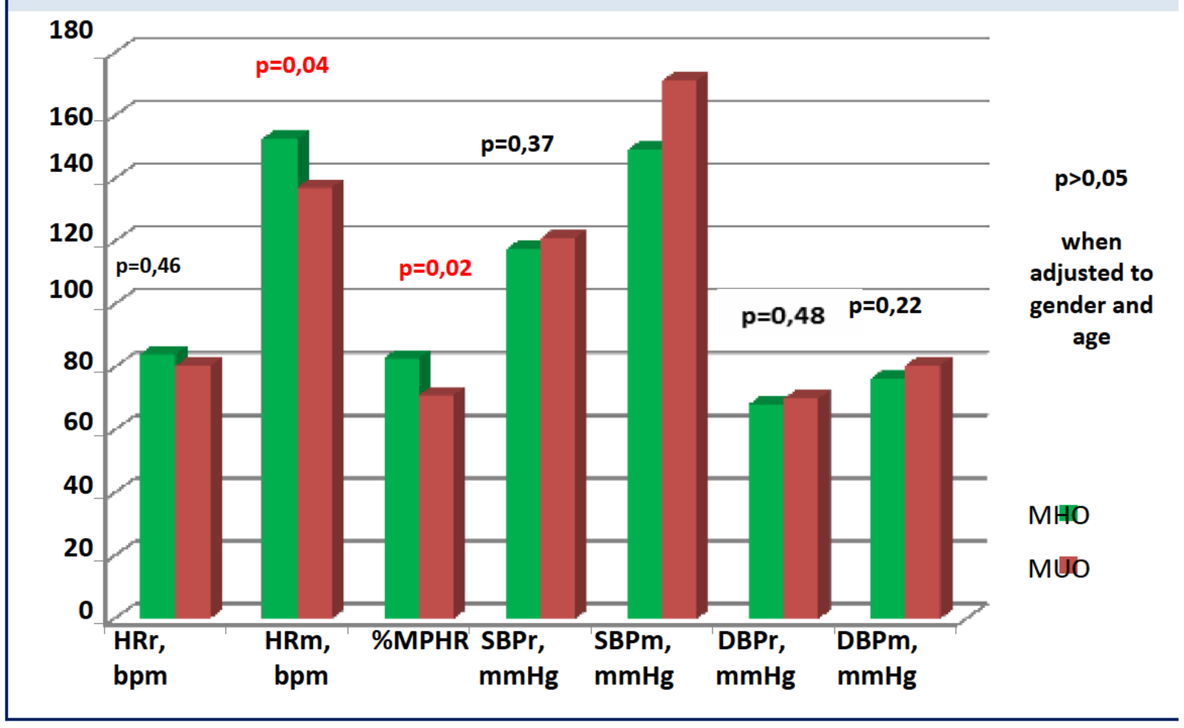
- Pediatric Metabolic Syndrome IDF criteria for grouping
- History, anthropometry
- Metabolic parameters: fasting lipids, glucose, Insulin followed by calculation insulin resistance indices HOMA-IR and ISI-FFA
- Multistage cycle protocol with further analysis of cardiovascular parameters: resting heart rate (HRr), maximal heart rate (HRm), resting and maximal systolic and diastolic blood pressure (SBPr, SBPm, DBPr, DBPm respectively). Maximal predicted heart rate (MPHR) was calculated by Tanaka formula and HRm in patient was compared with MPHR as a percent of it (%MPHR).

RESULTS

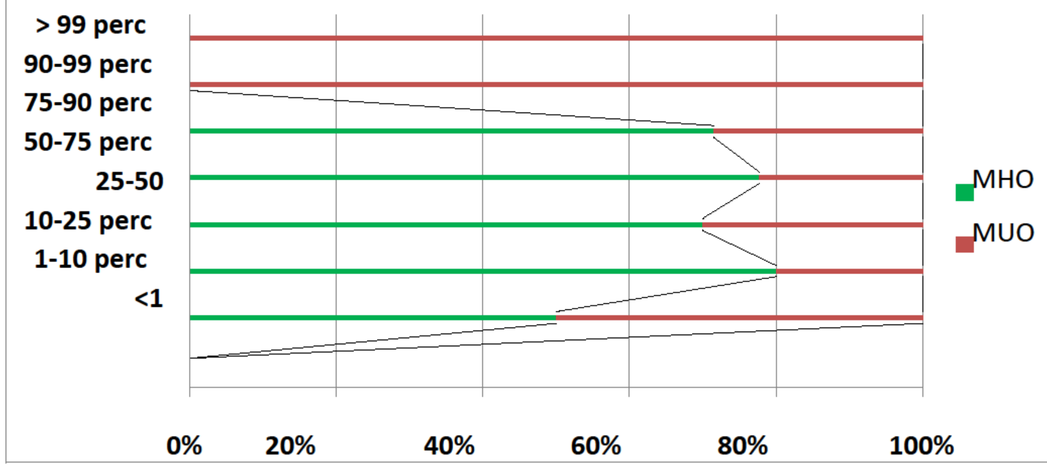
BASIC AND METABOLIC PARAMETERS

Basic and metabolic Parameters	MHO, n = 35		MUO, n = 10		MHO vs MUO,
	Mean	SD	Mean	SD	p
Age, years	14,072	2,928	13,508	3,194	0,219
Gender, % females	37,2		30,64		0,392
BMI, Z-score	2,65	0,738	3,11	0,898	<0,001
BMI, kg/m^2	30,829	5,497	32,825	5,751	0,019
WHR	0,589	0,089	0,598	0,137	0,744
TC, mmol/l	4,267	0,747	4,63	0,809	0,003
TG, mmol/l	1,166	0,264	1,594	0,573	<0,001
HDL, mmol/l	1,2	0,229	1,06	0,144	<0,001
Glucose fasting, mmol/l	4,608	1,173	4,698	0,786	0,583
Insulin fasting, µU/l	24,062	11,67	25,545	11,8	0,431
HOMA-IR	4,954	2,803	5,356	2,578	0,364

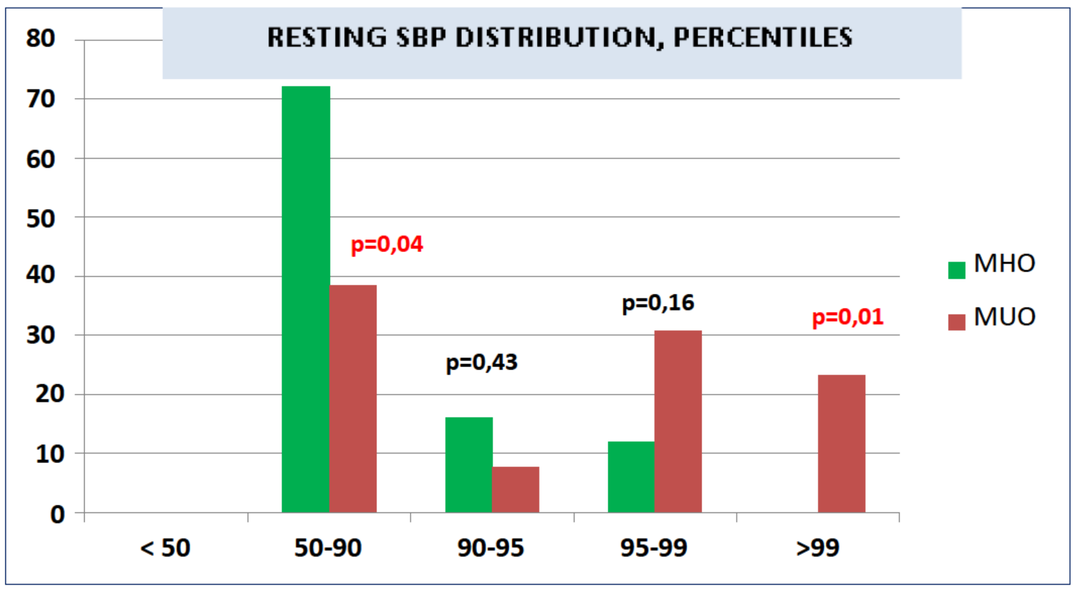
RESTING AND EXERCISE INDUSED CARDIOVASCULAR PARAMETERS



RESTING HR DISTRIBUTION, PERCENTILES



RESTING SBP DISTRIBUTION, PERCENTILES



CARDIOVASCULAR RESPONSE AT EXERCISE in MHO vs. MUO

MHO - predominantly chronotropic response with an increasing HRm till 152,714+18,611 vs. 137,2+23,917 bpm (P=0,041)

MUO - predominantly inotropic response with an increasing SBPm till 171,222+18,123 vs. 149,171+21,467 mm Hg (P=0,007

% of MPHR in MUO (Observed vs. Expected Frequencies): Chi-Square = 767,8897 df = 43 p < 0,001)

MULTIPLE LINEAR REGRESSION MODEL TO PREDICT EXERCISE INDUCED % MPHR

	β*	Std.Err. - of β*	B	Std.Err. - of B	p-value
Intercept			26,828	16,830	0,120
Lean BM	-0,727	0,192	-2,071	0,548	0,001
WHR	0,134	0,190	16,953	24,001	0,484
ISI-FFA	-0,300	0,130	-19,754	8,622	0,028
Cholesterol	0,519	0,147	7,602	2,164	0,001
TG	0,211	0,144	6,400	4,375	0,152
HDL	0,365	0,132	31,361	11,383	0,009

(MR=0,695; F(6,34)=5,53; P=0,004)

CONCLUSIONS:

1. Exercise tolerance is different in metabolically healthy and metabolically unhealthy obese adolescents.
2. There is an adequate chronotropic reactivity and moderate SBP increasing in metabolically healthy obese and predominantly inotropic response in metabolically unhealthy ones.
3. The recovery time for HR is higher in metabolically unhealthy subjects with no difference for BP recovery.
4. It seems metabolically unhealthy obese are under the risk of exercise induced chronotropic incompetence, which associated with acute cardiovascular events in studies.
5. Exercise induced chronotropic reactivity is linked to insulin sensitivity and dyslipidemia in obese adolescents

ESPE 2015 829--P3

Fat 1

Tetyana Chaychenko

DOI: 10.3252/pso.eu.54espe.2015

Poster presented at: 54th Annual Meeting 1-3 October ESPE 2015 BARCELONA European Society for Paediatric Endocrinology

PosterSessionOnline.com