Iron metabolism disorder in prepubertal obese children with and without NAFLD

Giannini Cosimo, Polidori Nella, Bagordo Marika, Primavera Marina, Mohn Angelika, Chiarelli Francesco

Department of Pediatrics, University of Chieti, Chieti, Italy

Background

Childhood obesity is associated with non-alcoholic fatty liver disease (NAFLD). Previous studies in obese adult and pubertal children with NAFLD have shown that chronic inflammation/oxidative stress and insulin resistance might induce iron metabolism disorders, characterized by increased Hepcidin and Ferritin levels and decreased serum Iron levels. However, data evaluating these findings in a well selected population of obese prepubertal children are still missing.

Aims of the study

- ❖ we aimed to characterize iron metabolism in a group of 40 obese prepubertal children with and without NAFLD defined by ultrasonography, compared to 40 healthy prepubertal age- and gender matched peers
- ❖ we also investigated correlations between iron metabolism and both oxidative stress and metabolic markers

Materials and methods

STUDY POPULATION
80 prepubertal children

20 with NAFLD 11Male/9Female

20 without NAFLD (12Male/8Female)

40 healthy prepubertal matched peers (22Male/18Female)

- ❖ Anthropometric measurements were determined
- ❖ Fasting blood samples were collected for measurement of insulin, glucose, lipid profile
- ❖ HOMA-IR was calculated as Insulin Resistance Index
- ❖ ALT, AST and iron profile including iron concentration, ferritin and hepcidin
- ❖ Lag-phase and MDA were evaluated as markers of oxidative stress

Statistical Analysis

- ❖ All values were expressed as means and SD
- ❖ Differences across the three groups were evaluated by One-way Anova test
- ❖ Post-hoc assessment was calculated by Bonferroni test
- ❖ In obese subjects a Pearson's correlation was used for searching correlations between Hepcidin and other parameters
- ❖ Significant values *P* <0.05

Results[1]

	Lean Healthy Controls	Obese without NAFLD	Obese with NAFLD	p*
Number	**40**	**20**	**20**	
Age (years)	**8.8±1.9**	**8.9±1.6**	**9.1±1.9**	**NS**
Sex (M/F)	**22/18**	**12/8**	**11/9**	**NS**
Weight (Kg)	**30.7±18.8**	**48.5±13.1**	**56.4±15.2**	**<0.01; †‡**
BMI (Kg/m²)	**17.8±3.6**	**25.1±3.4**	**27.6±4.3**	**<0.01; †‡**
WC (cm)	**57±5**	**78±12**	**86±11**	**<0.01; †‡º**
SBP (mmHg)	**103±9**	**110±15**	**112±13**	**0.03; ‡**
DBP (mmHg)	**59±5**	**63±8**	**63±8**	**NS**

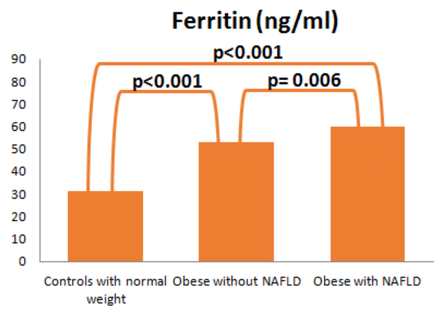
Obese without NAFLD versus Lean Healthy Controls†
Obese with NAFLD versus Lean Healthy Controls‡
Obese without NAFLD versus Obese with NAFLD º

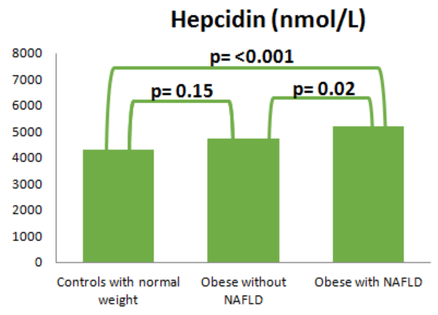
Results[2]

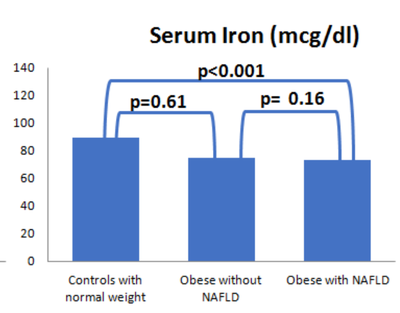
	Lean Healthy Controls	Obese without NAFLD	Obese with NAFLD	p*
LIPID PROFILE:				
Cholesterol total(mg/dl)	**110±10**	**151±26**	**156±19**	**<0.01; †‡**
TG (mg/dl)	**80±8**	**87±65**	**87±45**	**<0.01; †‡**
HDL (mg/dl)	**51±8**	**45±10**	**45±6**	**0.02; ‡**
INSULIN-RESISTANCE:				
Insulin (µU/mL)	**5.8±1.5**	**12.1±7.0**	**13.7±8.7**	**0.03; †‡**
Glycaemia (mg/dl)	**83±12**	**84±9**	**86±8**	**NS**
HOMA-IR	**1.26±0.50**	**2.75±2.40**	**3.01±1.58**	**0.03; †‡**
HEPATIC FUNCTION:				
ALT (U/L)	**24±7**	**27±5**	**36±9**	**<0.01; ‡º**
AST (U/L)	**22±5**	**27±8**	**37±26**	**0.01; †‡**

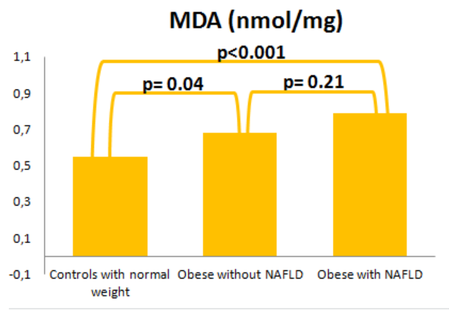
Obese without NAFLD versus Lean Healthy Controls†
Obese with NAFLD versus Lean Healthy Controls‡
Obese without NAFLD versus Obese with NAFLD º

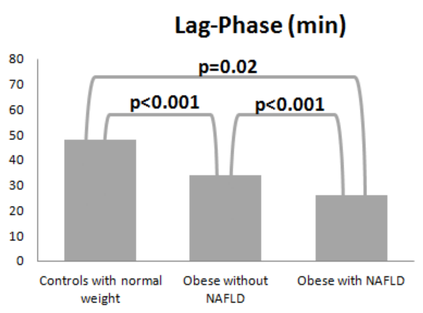
Results[3]



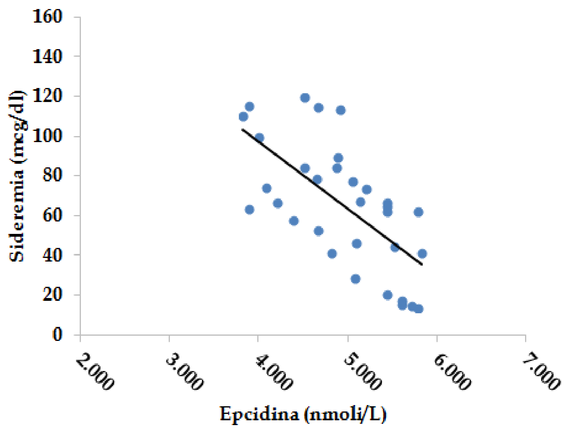


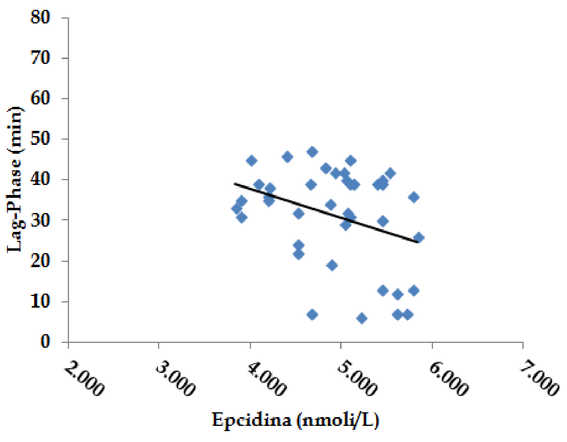






Results[4]





Conclusions

Obese prepubertal children show impaired iron metabolism disorders, especially in those subjects with NAFLD. The correlation between Hepcidin levels and increased oxidative stress activity in obese prepubertal children suggest a role of these components in the early pathogenesis of NAFLD in prepubertal children.

57ESPE 172--P2

Fat, metabolism and obesity

Francesco Chiarelli

Poster presented at: 57th ESPE 2018 Meeting ATHENS GREECE 27-29 September 2018

PosterSessionOnline.com