

# P2-345 Early onset of adiposity rebound is associated with higher leptin concentrations in 12-year old children

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- There are no conflicts of interest to report.

## Background

- We previously reported that children with an earlier adiposity rebound (AR), which is defined as the time at which the body mass index (BMI) starts to rise after infancy, have a higher BMI and a greater atherogenic metabolic status at age 12.
- In addition, it has been reported that higher levels of leptin at age 3 is associated with greater weight gain and adiposity by age 7. This finding suggests that leptin resistance may begin in early childhood, even before age 3.

## Objective

- To investigate if early onset AR is related to the acquisition of leptin resistance at age 12.

## Method

- A total of 296 children (157 boys and 139 girls) in one Japanese community were enrolled in the study. 271 children were able to define the age of AR and were divided into 6 groups according to AR age:  $\leq$ age 2, 3, 4, 5, 6,  $\geq$ 7.
- Leptin levels were measured at age 12. The association between age at AR and leptin levels were examined.

## Leptin levels at age 12

	total	boy	girl
total	4.8±1.8 (294)	4.1±1.8 (155)	5.8±1.7 (139)
Obese ( $\geq$ +20%)	9.7±1.8 (53)	8.4±1.8 (35)	12.6±1.7 (18)
non-obese ( $<$ +20%)	4.1±1.6 (241)	3.3±1.6 (120)	5.2±1.5 (121)

Data shows geometric mean±SD (ng/ml) (number in parentheses).  
p-value is  $<$ 0.0001 between obese and non-obese.

## Leptin levels at age 12 in boys depends on severity of obesity

	number	geometric mean±SD (ng/ml)
non-obese ( $<$ +20%)	120	3.3±1.6
light obese ( $\geq$ +20% and $<$ +30%)	18	6.5±1.5
moderate obese ( $\geq$ +30% and $<$ +50%)	12	8.5±1.6
severe obese ( $\geq$ +50%)	5	20.1±1.3

p $<$ 0.0001

## Leptin levels at age 12 in girls depends on severity of obesity

	number	geometric mean±SD (ng/ml)
non-obese ( $<$ +20%)	121	5.2±1.5
light obese ( $\geq$ +20% and $<$ +30%)	6	6.8±1.2
moderate obese ( $\geq$ +30% and $<$ +50%)	7	13.2±1.6
severe obese ( $\geq$ +50%)	5	20.9±1.3

p $<$ 0.0001

## An earlier AR was associated with higher leptin levels at age 12

the age of AR	total	boy	girl
$\leq$ 2y	7.4±2.0 (24)	6.4±2.0 (11)	8.3±2.0 (13)
3y	5.2±1.8 (26)	4.2±1.7 (13)	6.4±1.7 (13)
4y	5.2±1.8 (65)	4.4±1.9 (38)	6.5±1.7 (27)
5y	4.5±1.8 (74)	3.7±1.7 (39)	5.8±1.8 (35)
6y	4.5±1.6 (36)	3.9±1.8 (18)	5.1±1.4 (18)
7y $\leq$	3.7±1.6 (44)	3.2±1.8 (26)	4.4±1.3 (18)
p-value	p $<$ 0.0001	p $<$ 0.005	p=0.001

Data shows geometric mean±SD (ng/ml) (number in parentheses).

## Relationship between the age of AR and leptin levels at age 12 in obese children

the age of AR	total	boy	girl
$\leq$ 2y	11.3±1.8 (12)	9.2±1.8 (7)	15.0±1.6 (5)
3y	9.5±1.8 (5)	8.0±1.6 (4)	18.6 (1)
4y	9.7±2.0 (17)	8.0±2.1 (12)	13.4±1.6 (5)
5y	9.6±1.8 (11)	8.8±1.6 (6)	10.7±2.0 (5)
6y	8.6±1.9 (4)	8.6±2.1 (3)	8.6 (1)
7y $\leq$	(0)	(0)	(0)
p-value	p=0.467	p=0.894	p=0.385

## Relationship between the age of AR and leptin levels at age 12 in non-obese children

the age of AR	total	boy	girl
$\leq$ 2y	4.8±1.6 (12)	3.9±1.2 (4)	4.3±1.6 (8)
3y	4.5±1.6 (21)	5.5±1.6 (9)	3.6±1.6 (12)
4y	4.3±1.6 (49)	4.7±1.7 (27)	3.6±1.6 (22)
5y	4.0±1.6 (63)	4.4±1.5 (33)	4.3±1.6 (30)
6y	4.1±1.5 (32)	3.9±2.0 (15)	3.8±1.8 (17)
7y $\leq$	3.8±1.6 (43)	4.1±1.5 (25)	3.6±1.4 (18)
p-value	p=0.027	p=0.796	p=0.019

## Conclusion

- An earlier AR was associated with higher leptin levels at age 12, regardless of gender, suggesting that the timing of AR is an important factor that can predict leptin resistance in the future. Therefore, we propose that age of AR should be considered in early childhood to identify children at high risk for leptin resistance.

