

# HYPERLEPTINEMIA IN OBESE AND NON-OBESE CHILDREN WITH EARLY PUBERTY OR PRECOCIOUS PUBERTY

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## Background

Leptin is mainly produced by adipocytes. In animal and human, it is a potent anorectic and increases in obesity. Some reported that precocious puberty is prevalent in children with obesity.

## Objective and hypotheses

This study was done to see the changes of blood leptin levels in both obese and non-obese children with early puberty or precocious puberty.

## Method

Study patients consist of 325 children with early puberty or precocious puberty showing abnormally high blood leptin levels (>7.8 ng/mL) who visited our institute for GnRH stimulation tests between Jan 2014 and Feb 2015. Their medical records were reviewed retrospectively. And their clinical and laboratory data was analyzed.

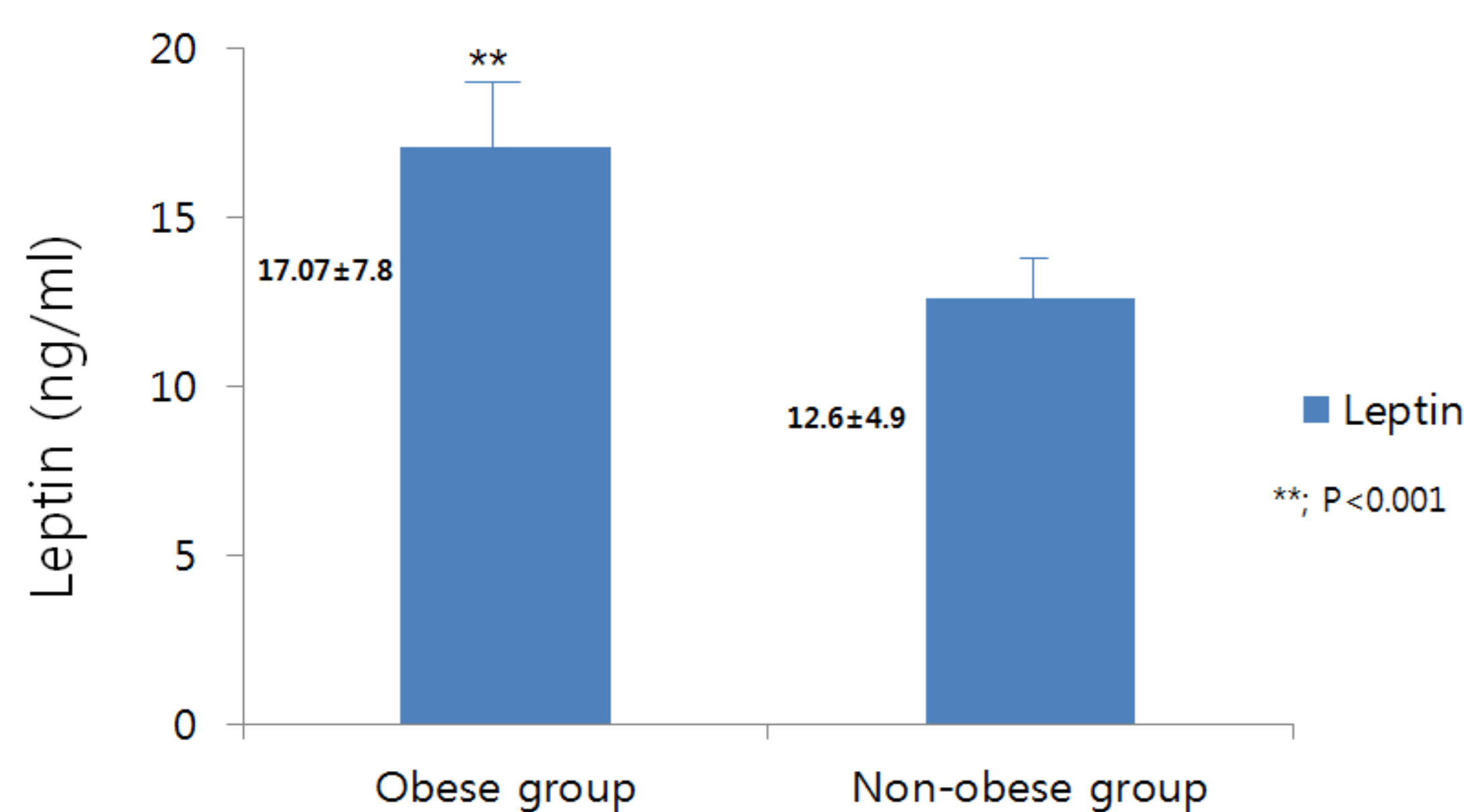
Table 1

Clinical and Laboratory Characteristics of Obese and Non-obese Early or Precocious Pubertal Children with Hyperleptinemia

	Obese	Non-obese	Total
Number of patients	71(22%)	254(78%)*	325(100%)
Male : female	9 : 62	43 : 211	52 : 273
Age (yrs)	8.6±1.6	9.3±1.6*	9.2±1.6
Boys (yrs)	10.4±2.1	11.1±1.3	11.0±0.4
Girls (yrs)	8.3±1.0	9.0±1.3*	8.8±1.3

\* P<0.001 compared to obese group

Figure 1



Difference of blood leptin levels(ng/mL) between obese and non-obese early puberty or precocious pubertal children with hyperleptinemia

Table 2

Changes of Blood Leptin Levels(ng/mL) in Obese Early Puberty or Precocious Pubertal Children with Hyperleptinemia depending upon Sexual Difference

	Male group	Female group	Total
No. of patients	9	62	71
Age (yrs)	10.4±2.1*	8.3±1.3	8.6±1.6
Blood Leptin (ng/mL)	23.2±11.2*	16.1±6.8	17.0±7.8

\*P<0.05 compared to female group

Table 3

Changes of Blood Leptin Levels(ng/mL) in Non-obese Early Puberty or Precocious Pubertal Children with Hyperleptinemia depending upon Sexual Difference

	Male group	Female group	Total
No. of patients	43	211	254
Age (yrs)	11.1±1.3*	9.0±1.3	9.3±1.6
Blood Leptin (ng/mL)	12.4±4.6	12.6±5.0	12.6±4.9

\*P<0.001 compared to female group

Table 4

Changes of Blood Leptin Levels(ng/mL) in Obese Early Puberty or Precocious Pubertal Children with Hyperleptinemia depending upon GnRH Stimulation Test

	GnRH(+) group	GnRH(-) group
No. of patients	31	40
Age (yrs)	9.3±1.8*	7.9±0.9
Blood Leptin (ng/mL)	17.4±8.7	16.7±7.0

\*P<0.05 compared to GnRH (-) group

Table 5

Changes of Blood Leptin Levels(ng/mL) in Non-Obese Early Puberty or Precocious Pubertal Children with Hyperleptinemia depending upon GnRH Stimulation Test

	GnRH(+) group	GnRH(-) group
No. of patients	163	91
Age (yrs)	9.9±1.5*	8.4±1.1
Blood Leptin (ng/mL)	12.5±5.1	12.7±4.5

\*P<0.001 compared to GnRH(-) group

Table 6

Comparisons of ages at diagnosis and Blood Leptin Levels(ng/mL) between Obese and Non-obese GnRH(+) Girls with early puberty or precocious puberty

	Obese GnRH(+) girls	Non-obese GnRH(+) girls
No. of pts	25	128
Age (yrs)	8.8±1.4*	9.5±1.3
Blood Leptin (ng/mL)	16.5±8.0**	12.5±5.2

\*P<0.05 compared to Non-obese GnRH(+) girls

\*\*P<0.001 compared to Non-obese GnRH(+) girls

## Summary

Hyperleptinemia was more frequent in non-obese group than obese group(P<0.001).

Blood leptin levels (ng/mL) was significantly higher in obese group compared to non-obese group(p<0.001).

Male had significantly higher blood leptin levels than female in obese group(p<0.05).

Obese GnRH (+) girl's age was younger than non-obese GnRH (+) girls (p<0.05).

## Conclusion

Hyperleptinemia was more frequently found in non-obese sexually precocious children than expected.

And it seems that obesity may associate with earlier pubertal onset in GnRH (+) girls with hyperleptinemia. Further study regarding the mechanism of hyperleptinemia and its clinical significance in non-obese children with early puberty or precocious puberty is necessary.

