Chronic leptin infusion advances puberty onset in sham and pinealectomized normally fed female rats

Haluk Kelestimur

Firat University
Faculty of Medicine
Department of Physiology
&
The Institute of Health Science
Department of Neuroendocrinology
Topics

- Puberty
- Melatonin
- Leptin
My Pubertal Place
Changing relation between probable range of menarcheal age and psychosocial transitions into adulthood

George C Patton, Russell Viner
Lancet 2007; 369: 1130–39
Leptin

- Adrenarche
- Gonadarche
- Skeletal growth
Schematic presentation of the reproductive roles of leptin and ghrelin

Pineal gland synchronizes seasonal reproduction with optimum environmental conditions.
Effects of Pinealectomy on Leptin in Anterior Pituitary

Effects of Pinealectomy on Ghrelin in Arcuate Nucleus

KISS-MT Tango

- Melatonin
- Kiss
- GnIH
- GnRH

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Puberty-Leptin-Melatonin

- Precocious puberty is associated with high leptin and low melatonin levels.

- Delayed puberty is associated with low leptin and higher melatonin levels.
Obesity + More light = Early puberty

More leptin + Less melatonin = Early puberty
The questions

- Does prepubertal leptin increase advance puberty onset?
- Can pineal gland modify the effect of leptin on puberty onset?
Hypothesis

A pubertal increase in leptin and decrease in melatonin gates onset of puberty

Test

Does the administration of leptin to prepubertal pinealectomized animals advance puberty onset?
**Experimental Design**

15 day old Wistar Female Rats

Subcutaneous osmotic pump implantation
(0.25µl/hour, 1µg/day, 4 weeks)

Examine

- Body weight
- Food intake
- Day of VO
- Oestrous cycle
- Ovarian weight
- Uterine weight

**Animal Groups**

- Leptin (n=6)
- Leptin (n=5)
- Vehicle

**Treatment Conditions**

- PNX
- SHAM

21st day
Effect of leptin on vaginal opening in pinealectomized rats
The body weights on the day of vaginal opening

- Pnx Leptin
- Sham Leptin
- Sham Vehicle

* indicates statistical significance.
Effects of leptin on ovarian and uterine weights
Effect of leptin on cumulative food intake over time
Effects of leptin on body weight change (%)
Conclusions

- Pre-weaning peripheral leptin infusion advances puberty onset.
- Low leptin dose can advance puberty onset without affecting food intake.
- Leptin-infused rats showed puberty in a low weight.
- Leptin administration signals high fat store for brain in during weaning period.
- Pinealectomy did not modify effect of leptin significantly.
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Teşekkür ederim or Thank you