

Messenger Ribonucleic Acid Expression of *KiSS-1* and Serum Level of Kisspeptin in Rat at Different Developmental Stages



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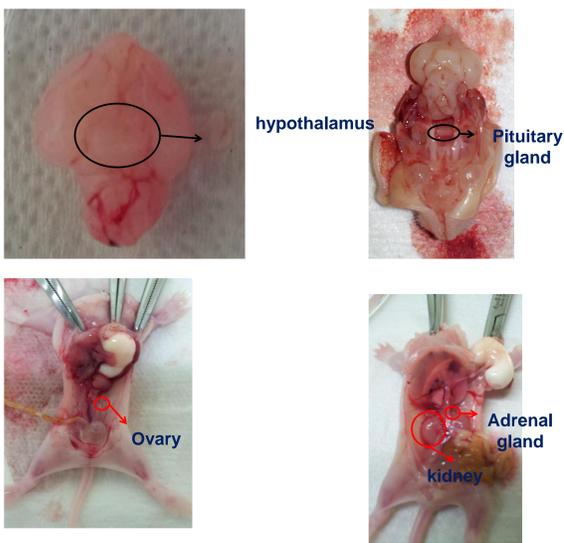
Abstract

KiSS-1 and its product, kisspeptin is necessary for puberty onset and proper adult gonadal function due to its stimulatory effect on the secretion of GnRH. Although the pathophysiological importance of *KiSS-1* and kisspeptin is well known, the developmental patterns of expression of *KiSS-1* genes and serum level of kisspeptin have not been explored to date.

Objectives

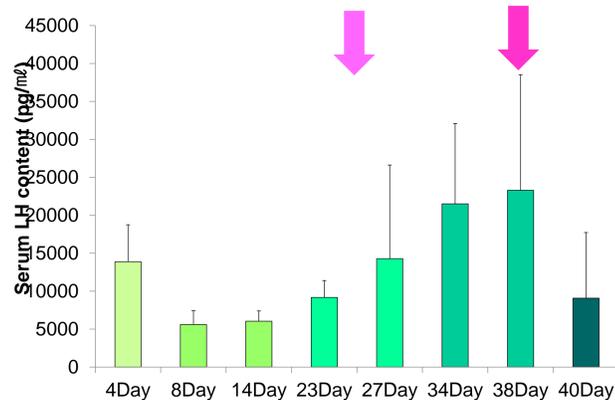
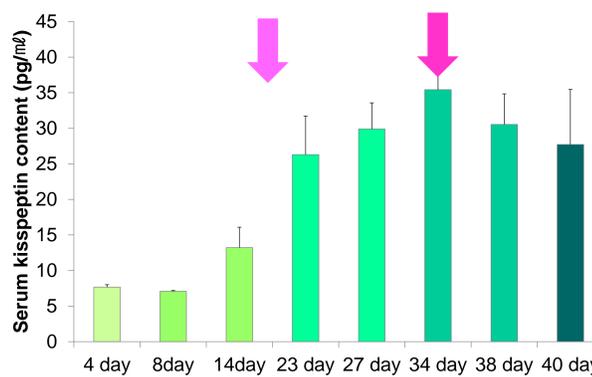
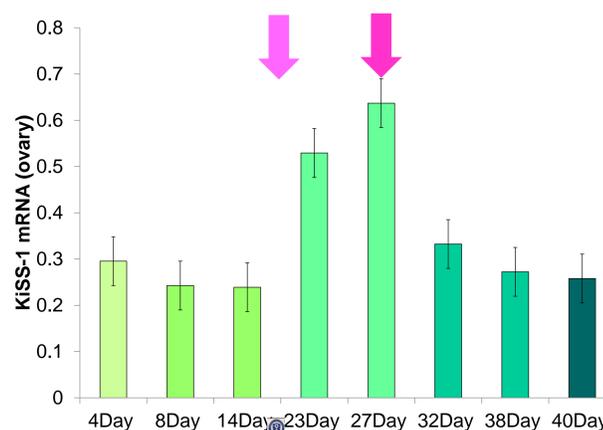
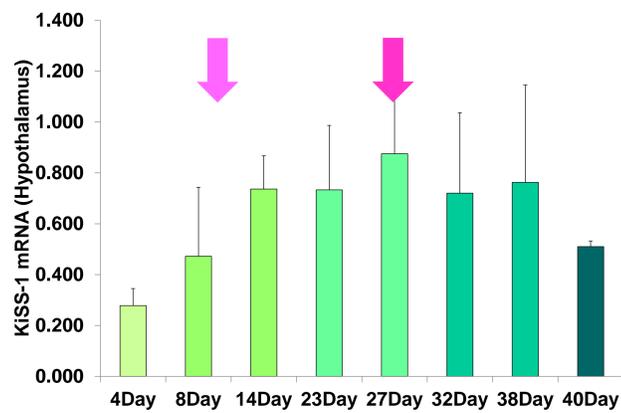
We report herein the expression profile of *KiSS-1* genes and serum level of kisspeptin in the rat at different developmental stages.

Methods



Sprague-Dawley (SD) strain female rats were used. To analysis expression of *KiSS-1* mRNA, samples were obtained from hypothalamus, pituitary, ovaries, adrenal glands and pancreas in female rats at 4 day, 8 day, 14 day, 23 day, 27 day, 34 day, 38 day and 40 day. At the same time, blood samples were collected for analysis serum level of kisspeptin and luteinizing hormone (LH). The expression of *KiSS-1* mRNAs was assessed by RT-PCR and the serum levels of kisspeptin and LH were analyzed by ELISA.

Results



Summary

The expressions of *KiSS-1* gene in hypothalamus and ovary were increased according to developmental stages and were peaked at prepubertal stage (at day 27, respectively, 0.88 ± 0.22 , 0.54 ± 0.25). However, there were no significant changes or correlations between developmental stages and *KiSS-1* gene expression in pituitary, adrenal glands and pancreas. Serum kisspeptin level was increased according to developmental stages as *KiSS-1* gene mRNA expression. However, peak level of kisspeptin (35.43 ± 3.60 pg/mL) was in pubertal stage at day 34. Serum LH level was also increased and peaked (23.29 ± 15.24 ng/mL) at pubertal stage (at day 38) as serum kisspeptin level. However, an increasing pattern was little delayed than that of kisspeptin level.

Conclusions

The expressions of *KiSS-1* mRNA were increased in hypothalamus and ovary according to developmental stages in rat. Serum levels of kisspeptin were also increased during developmental stages, followed by serum LH levels. Furthermore, the peak expression of *KiSS-1* mRNA and the peak serum levels of kisspeptin and LH were observed during prepubertal and pubertal stages in regular sequence. Therefore, serum kisspeptin levels can be an indication of *KiSS-1* gene expression in hypothalamus and pubertal onset.

References

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2. Physiological roles of the kisspeptin/GPR54 system in the neuroendocrine control of reproduction. Prog Brain Res 2010 Vol 181, 55-77
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Neonate Day 1-Day 7		Infant Day 8 –Day 21			Prepuberty Day 22 – Day 31		Puberty Day32–Day38		Adult Day39
↑	↑	↑	↑	↑	↑	↑	↑	↑	
Day 4	Day 8	Day 14	Day 23	Day 27	Day34	Day38	Day 40		