

The Expression of Related Neuroendocrine Factors with Puberty Onset in Rat at Different Developmental Stages

Mo Kyung Jung, Ki Eun Kim, Ah Reum Kwon, Hyun Wook Chae, Ho-Seong Kim

Department of Pediatrics, Severance Children's Hospital, Yonsei University College of Medicine, Seoul, Korea

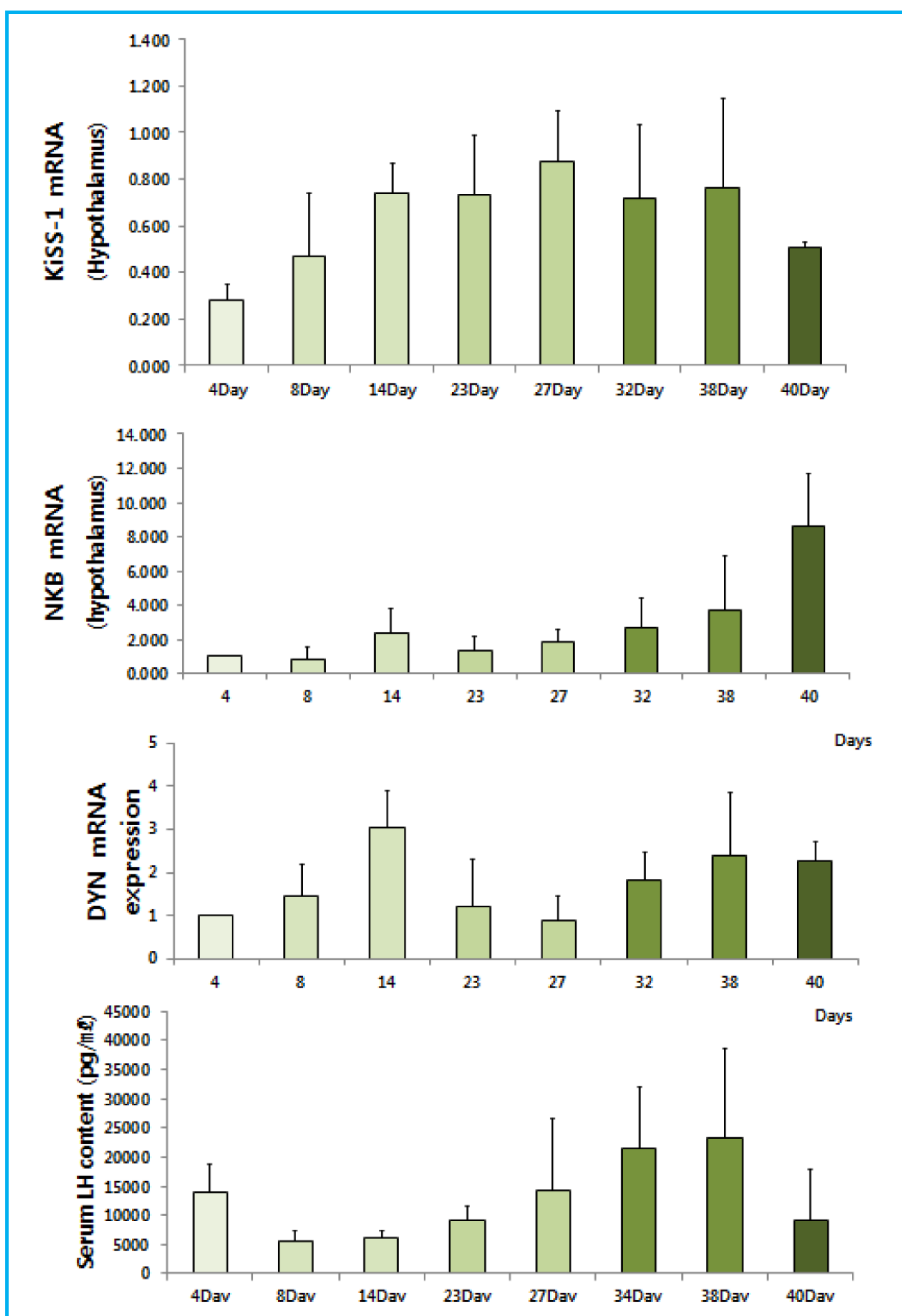
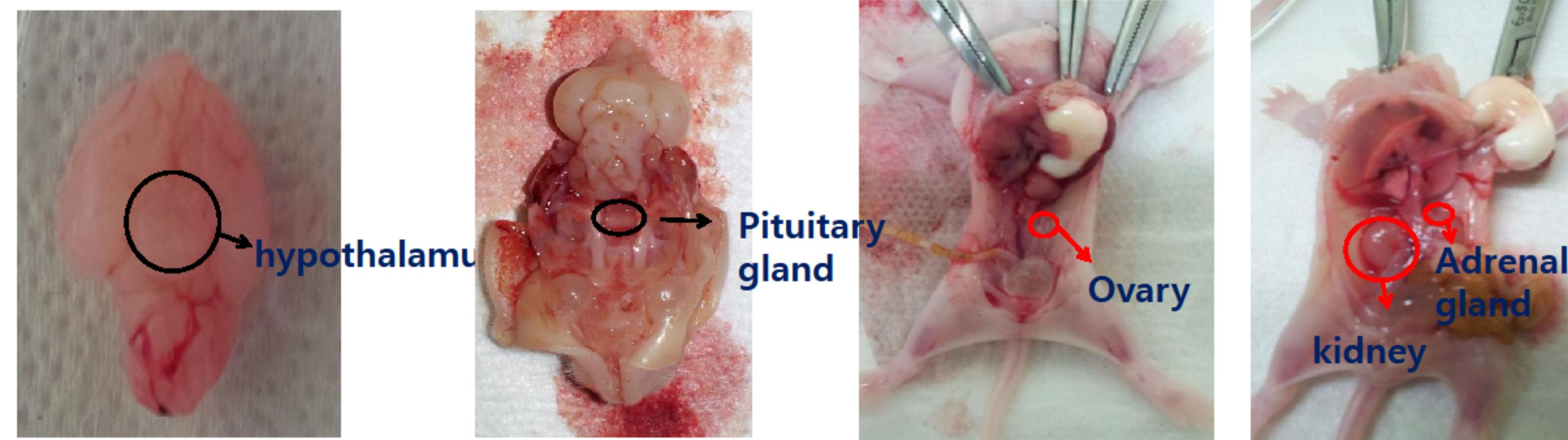
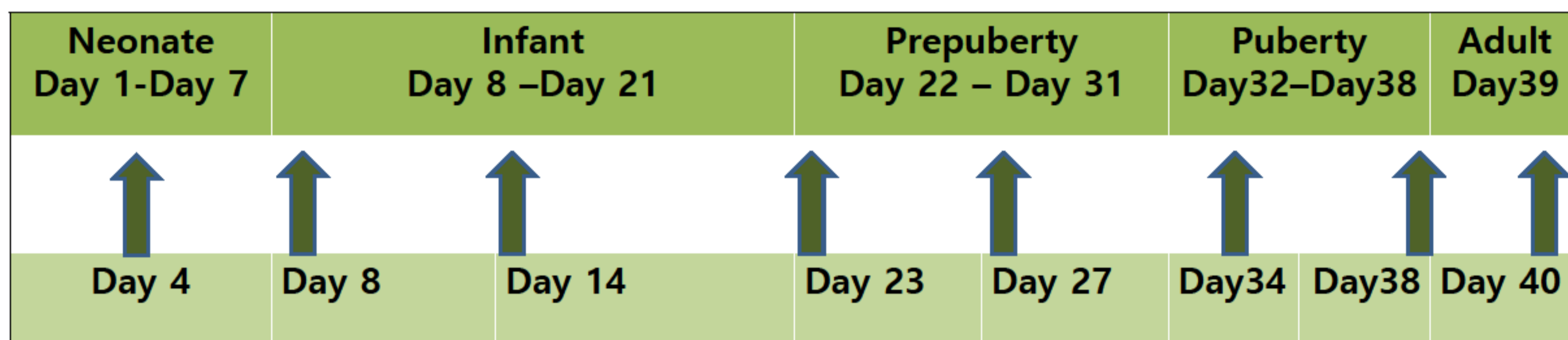
Introduction

Kisspeptin is well known gatekeeper of puberty onset to date. However, several neuroendocrine factors are also discovered to be associated with puberty onset, especially neurokinin B and dynorphin A participate in the neuronal network integrating reproduction with kisspeptin. Therefore Kisspeptin, neurokinin B and dynorphin A were called 'KNDys' and became an object of investigation. However, the interactions between KNDys and the reproductive axis have not yet been fully explored. We report herein the expression profile of KNDy gene in the rat at different developmental stages.

Methods

Sprague-Dawley (SD) strain female rats were used. To analysis expression of *KNDys* mRNA, samples were obtained from hypothalamus 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 *KNDys* mRNAs was assessed by RT-PCR and the serum levels of kisspeptin and LH were analyzed by ELISA.

Results



Summary

The expression of Neurokinin B mRNAs in hypothalamus was low in neonate and infant stages and steadily increased prepubertal and pubertal stages (between day 27 and day 40). The expression of KiSS-1 mRNA was also increased as according to developmental stages. However, Neurokinin B mRNAs expression was increased more slowly than KiSS-1 mRNA expression. Meanwhile, the expression of dynorphin A mRNA in hypothalamus was also increased until infantile stage and decreased from infantile to prepubertal stages, but were increased again and maintained high level in pubertal and adult stage.

Conclusion

KiSS-1, NKB and DYN gene contributed pubertal onset by interaction with each other. Pubertal onset may be induced by increased KiSS-1 mRNA, NKB mRNA expression and decreased DYN mRNA expression. However, KiSS-1, NKB, DYN mRNA were moderately increased in pubertal and adult stages, these may make estrus cycles.