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Timing of Salt Intake from Circadian Aspect

Hideaki Oike

National Food Research Institute (NFRI), National Agriculture and Food Research Organization (NARO)
2-1-12 Kannondai, Tsukuba, Ibaraki 305-8642, Japan

Summary

In mammals, circadian clocks are thought to be important on peripheral tissues for adjusting physiological events to environment. Unlike the central clock, which is located on suprachiasmatic nucleus and mainly driven by light/dark cycles, many peripheral clocks are influenced by feeding schedule. But the roles of peripheral clocks and the regulating factors are little known. Therefore, we examined the effects of high-salt diet on circadian rhythms of mice. We fed mice with high-salt diet (4.0% or 8.0% NaCl) or normal-salt diet (0.3% or 0.6% NaCl) for 4 weeks. Peripheral expression of clock genes, *Bmal1*, *Dbp*, *Per1*, *Per2* and *Rev-erba* in the kidneys and livers and locomotor activity were determined by real-time PCR and wheel running, respectively. The phase of clock genes was advanced in the both tissues of mice fed high-salt diet, but locomotor activity is not different between both groups. Expression rhythms of metabolic marker genes, *PPAR α* , *PEPCK1* (*Pck1*), and *PDK4* were also advanced in liver. Our result indicated that high-salt diet advanced the peripheral circadian clocks without affecting central clock.