

Daily Rhythms of Total Activity in Rabbits During Different Light/Dark Schedules

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Abstract: The aim of this study was investigated total activity in rabbits subjected to different light/dark schedules. A wide variety of organisms exhibit different circadian rhythms in their behavior and physiology. Circadian rhythms are regulated by internal clocks that are generally entrained primarily by the environmental light/dark (L/D) cycle. Total activity was studied in 5 female rabbits (*Oryctolagus cuniculus*, Blue Vienna breed) subjected to different 12/12 light/dark cycle schedules (Phase 1: light on from 08:00-20:00; Phase 2: light on from 20:00-08:00; Phase 3: light on from 08:00-20:00). General activity of individual animals was monitored continuously by an activity data-logger (Actiwatch, Mini Mitter Co., Bend, OR). The robustness of the activity rhythm was very low in all animals in all stages of the experiment, with all activity concentrated almost exclusively during the dark period.

Key words: Circadian rhythm, total activity, *Oryctolagus cuniculus*

INTRODUCTION

Circadian timekeeping systems play a role in the internal temporal coordination of physiological and behavioral processes of organisms (Jilge, 1993). A wide variety of organisms exhibit daily rhythms of behavioral and physiological changes. These rhythms are mostly generated by an endogenous circadian timing system that is entrained by environmental cues, or zeitgebers. The light:dark (L:D) cycle is the most potent cue for circadian entrainment in most organisms. Circadian rhythms probably evolved as adaptations that allowed organisms to prepare for relatively predictable environmental changes associated with the day-night cycle (Pittendrigh, 1993). Also, in several species, regulation of circadian timing by behavioral (so-called non-photoc) stimuli is well documented. Behavioral arousal stimulated during the middle of the usual rest phase of the circadian rest-activity cycle can induce large phase advance shifts, sufficient to modify the phase angle of entrainment to LD cycles, to greatly accelerate reentrainment to a shifted LD cycle and to stably entrain free-running rhythms in the absence of LD cycles (Mistlberger and Skene, 2004). An alternative method for stimulating activity and arousal in some species is short-term Food Deprivation (FD). However the effects of fasting on the probability or amount of running in a novel wheel during the usual rest period have not been reported (Mistlberger *et al.*, 2006).

Rabbits show circadian variation in several behavioral, physiological parameters (Van Den Been and Malpas, 1997) and haematological parameters (Piccione *et al.*, 1995). They show a

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