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Effect of melatonin on circadian water intake by normal and tumor-bearing rats.

The Dark-Light (DL) water intake rhythm by rats can be reversed by parenteral Melatonin (MLT), according to administration time. We have investigated the effect of i.p. MLT injection in normal (n=5) and cutaneous tumor-bearing rats (CTBR) (n=4).

All the rats had been kept for two years in identical dietetic and surrounding physical conditions. Their weight was 470.5 ± 92.94 g. in CTBR, and 387.8 ± 45.2 g. in normal rats.

All rates ate the same ad libitum balanced diet. MLT, dissolved with adenosine in distilled water, was injected in late afternoon i.p. at dosage 0.0519 mg./100 g b.w. in CTBR and 0.063 mg/100 g. b.w. in normal rats.

Water was drunk from 4 water glasses fastened along one side of the cage, which were weighed at 6 a.m. and p.m. The following results were obtained. (1) D/L water intake difference is higher in normal than in CTBR. (2) There seems to be some gradual habituation to successive MLT treatment. (3) L-water intake is less influenced by MLT injection than D-water intake.

The results seem to indicate that water of normal tissues is in a different lattice from water of CTBR tissues, and is moderately influenced by MLT. The lengthening of the NMR lattice spin relaxation time would support this suggestion. An at least partial role in this phenomenon of tumor pathogenesis is probably exerted by vasopressin, which is synthesized by tumor tissue (W.G. North et al., *Ann. N.Y. Acad. Sci.*, 1994, **689**, 107-121).