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JOURNAL ARTICLE

The effects of spinal cord injury on the status of messenger ribonucleic acid for TRPM 2 and androgen receptor in the prostate of the rat

H. F. Huang, M. T. Li, T. A. Linsenmeyer, J. E. Ottenweller, L. M. Pogach and R. J. Irwin

Department of Surgery, UMD-New Jersey Medical School, Newark 07103-2714, USA.

The prostate is one of the male accessory sex glands that produce fluid components of the seminal plasma. In addition to androgen, a normal innervation of the prostate is believed to be important for maintaining normal function of the prostate. Previously we noted that, in the rat, the weight of the prostate decreased following surgically induced spinal cord injury (SCI). This observation suggests that growth, and possibly function, of the prostate may be compromised after SCI. To explore this possibility, we examined the effects of SCI on the androgen-related biochemical properties and morphology of the prostate in the rat at various times after surgically induced SCI. SCI resulted in an acute decrease in prostate weight and an increase in steady state level of mRNA for testosterone-repressed prostate message 2 (TRPM 2) during the first 2 weeks postinjury. These changes perhaps relate to an increase in cell death or a decrease in secretory activity due to an acute suppression of serum testosterone after the injury. Concomitantly, there was a transient, but significant, decrease in the steady state level of androgen receptor (AR) mRNA in the prostate during the first 2 weeks after SCI, an indication of an altered autoregulation of AR by its own ligand. Despite the fact that growth of the prostate, as indicated by weight increase, in SCI rats resumed 2 weeks postinjury, prostate weights were persistently lower in SCI rats than sham-operated controls for at least 3 months. Furthermore, prostate TRPM 2 mRNA levels remained elevated throughout the recovery period even after a normal prostate weight had been restored. In addition, a decrease in the height of ventral prostate epithelial cells was noted in SCI rats 28 and 90 days postinjury. These results demonstrate a prolonged effect of SCI on prostate function. These findings and our unreported observation of persistently smaller seminal vesicles in the same groups of SCI rats suggest that functions of male accessory sex glands may also be compromised after SCI. These changes may affect biochemical properties of the secretory products of these glands and may provide some explanation for the reported changes in the composition of the seminal plasma and abnormal sperm motility seen in the semen of SCI men.

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