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JOURNAL ARTICLE

Metabolic studies on the rabbit corpus cavernosum

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Erectile function (erection and detumescence) involves the complex interaction of direct neuronal stimulation of corporal smooth muscle, neurohumoral release of specific endothelial contractile and relaxant factors, and secondary modulation by a variety of putative neuropeptides and vasoactive modulators. The net result is a rapid and sustained relaxation of the smooth muscle elements during erection and contraction of the smooth muscle during detumescence. Proper function of the corporal tissue is dependent upon cellular metabolism of glucose and the generation of cellular energy in the form of high energy phosphates. The current study characterizes the following metabolic parameters of the rabbit corpus cavernosum: Tissue concentrations of creatine phosphate (CP), ATP, ADP, and AMP; maximal rate of glucose metabolism to lactic acid and CO2; and activities of the enzymes creatine kinase (CK), citrate synthase, and malate dehydrogenase. For comparative purposes only, bladder smooth muscle preparations were analyzed simultaneously with and under the same conditions as the corpus cavernosum. The results are as follows: The concentrations of ATP and CP in the corpora were significantly lower than the concentrations in bladder. In the corpora, the tissue concentration of CP was lower than the tissue concentration of ATP, whereas the concentration of CP in the bladder was higher than the concentration of ATP. The rate of glucose metabolism to lactic acid and to carbon dioxide was similar for both bladder smooth muscle and corpus cavernosum. The maximal enzymatic activity of the mitochondrial enzyme citrate synthase was similar for both tissues; similarly, there was no significant difference in the activity of malate dehydrogenase between the two tissues.(ABSTRACT TRUNCATED AT 250 WORDS)

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