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# The Effects of Cyclic Adenine Nucleotides, Phosphodiesterase Inhibitors, and Cauda Epididymidal Fluid on the Motility of Rat Epididymal Spermatozoa

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Experiments were performed to determine whether the rat epididymis secretes a "forward-motility" factor(s) similar to that found by others in the bovine epididymis. Lumen content of the rat caput and cauda epididymidis was collected by micropuncture. Caput and cauda spermatozoa were diluted in .154 M NaC1, 25 mM theophylline, or 10 mM cAMP, dibutyryl cAMP, 8-bromo cAMP, or 8-bromo AMP in saline. Progressive motility was judged by determining linear distance traveled by sperm in the various diluents after 30-minute incubation at 37 C. Neither theophylline nor cyclic adenine nucleotides cause caput sperm to swim distances attained by cauda spermatozoa. In other experiments, caput spermatozoa were preincubated for either 5 or 30 minutes at either 32 C or 37 C with fresh cauda lumen fluid prior to dilution with the test solutions. Cauda fluid did not significantly enhance the progressive motility of caput sperm in any diluent. Stimulation with 25 mM theophylline always resulted in more distance traveled than with any other diluent. This effect was reproduced by 25 mM caffeine, another xanthine phosphodiesterase inhibitor (PDI). There was no stimulation of motility with 200 µM papaverine, a nonxanthine PDI. The results of this study failed to demonstrate the presence of a factor in lumen fluid of the distal rat epididymis that acts in conjunction with cyclic adenine nucleotides to induce mature cell motility in immature spermatozoa.

Key words: spermatozoa, motility, epididymal, rat

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