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Effect of Vasectomy on Sperm Nuclear Chromatin Condensation in the Rabbit

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Histone-to-protamine exchange in haploid spermatids is known to play a central role for male fertility. The present study investigates, for the first time, the effects of vasectomy on the expression of protamines in the rabbit. During normal spermatogenesis, protamine-1 and protamine-2 mRNA were expressed from step 5 round spermatids to step 11 elongated spermatids. In unilaterally vasectomized animals, control testes revealed normal spermatogenesis with normal protamine expression, while vasectomized testes exhibited both normal spermatogenesis and spermatogenic arrest. Some testes with normal spermatogenesis revealed delayed expression of both protamine-1 and protamine-2. Furthermore, multinucleated round spermatids were a regular finding in these testes. In both treated and untreated animals, a higher percentage of spermatozoa from the cauda epididymis had highly condensed chromatin when compared with those from the testis. The percentage of spermatozoa with highly condensed chromatin from testes and epididymides from the vasectomized side of treated animals remained unchanged from controls. As the integrity of nuclear chromatin is important for oocyte fertilization, especially in intracytoplasmic sperm injection (ICSI), where most of the natural selection mechanisms are bypassed, our data add valuable information for the treatment of infertility by ICSI, showing that vasectomy may affect nuclear chromatin integrity of testicular spermatids but not epididymal spermatozoa. Microsurgical epididymal sperm aspiration (MESA), therefore, may be superior to testicular sperm extraction (TESE) in vasectomized patients.

Key words: Protamine, spermatogenesis, vasectomy

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