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Infertile Men With Varicocele Show a High Relative Proportion of Sperm Cells With Intense Nuclear Damage Level, Evidenced by the Sperm Chromatin Dispersion Test

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The frequency of sperm cells with fragmented DNA was studied in a group of 18 infertile patients with varicocele and compared with those obtained in a group of 51 normozoospermic patients, 103 patients with abnormal standard semen parameters, and 22 fertile men. The spermatozoa were processed to discriminate different levels of DNA fragmentation using the Halosperm® kit, an improved Sperm Chromatin Dispersion (SCD) test. In this technique, after an acid incubation and subsequent lysis, those sperm cells without DNA fragmentation show big or medium-sized halos of dispersion of DNA loops from the central nuclear core. Otherwise, those spermatozoa containing fragmented DNA either show a small halo, exhibit no halo with solid staining of the core, or show no halo and irregular or faint stain of the remaining core. The latter, that is, degraded type, corresponds to a much higher level of DNA-nuclear damage. The varicocele patients showed 32.4% ± 22.3% of spermatozoa with fragmented DNA, significantly different from the group of fertile subjects (12.6% ± 5.0%). Nevertheless, this was not different from that of normozoospermic patients (31.3% ± 16.6%) (P = .83) and with abnormal semen parameters (36.6% ± 15.5%) (P = .31). No significant differences were found between the normozoospermic patients and the patients with abnormal semen parameters. Strikingly, the proportion of the degraded cells in the total of sperm cells with fragmented DNA was 1 out of 4.2 (23.9% ± 12.9%) in the case of varicocele patients, whereas it was 1 out of 8.2 to 9.7 in the normozoospermic patients (11.1% ± 9.9%) in the patients with abnormal sperm parameters (12.2% ± 8.3%) and in the fertile group (10.3% ± 7.2%). Thus, whereas no differences in the percentage of sperm cells with fragmented

DNA were evident with respect to other infertile patients, individuals with varicocele exhibit a higher yield of sperm cells with the greatest nuclear DNA damage level in the population with fragmented DNA. This finding illustrates the value of assessing different patterns of DNA-nuclear damage within each sperm cell and the particular ability of the Halosperm® kit to reveal them.

Key words: Human sperm, DNA fragmentation