
Editorial Commentary

Brackett NL, Ibrahim E, Grotas JA, Aballa TC, Lynne CM. Higher sperm DNA damage in semen from men with spinal cord injuries compared with controls. *J Androl.* 2007;29:93–99.

The authors of this manuscript present 3 separate experiments assessing sperm DNA damage in men with spinal cord injury.

In experiment 1, the authors compared DNA Fragmentation Index (DFI) in men with spinal cord injury vs controls, and they reported a significantly higher percentage of DFI in men with spinal cord injury.

In experiment 2, the investigators determined percentage of DFI in repeated ejaculations and found that a high degree of correlation existed in percentage of DFI for samples collected on day 0 and day 3 (3 days later) in the same patients, leading the authors to conclude that an increased period of abstinence was not responsible for the elevated percentage of DFI seen in patients with spinal cord injury.

Finally, in experiment 3, the authors compared percentage of DFI in neat samples vs processed semen samples, free of necrospemia and leukocytospermia. They found no significant difference in the percentage of DFI and concluded that increased sperm DNA damage in patients with spinal cord injury is not due to the proximate presence of white blood cells or dead sperm in the samples.

The Miami Project to Cure Paralysis and other groups have performed a number of innovative studies over the years in an attempt to elucidate the pathophysiology underlying the decreased reproductive potential in men with spinal cord injury. Putative factors, such as disordered storage of sperm, urinary tract infection, elevated levels of inflammatory cytokines, and increased concentrations of reactive oxygen species all have been implicated as pathophysiologic mediators of impaired reproductive potential in these men. (Ohl et al, 1999; Elliott et al, 2000; Ohl et al, 2001; Brackett et al, 2000; Ohl et al, 1992; Padron et al, 1997; Basu et al, 2004).

While debate over the clinical utility of DFI and other measures of sperm DNA damage continues on in the infertility literature, the unique question regarding sperm DNA damage in men with spinal cord injury is addressed in this study. Perhaps not surprisingly, experiment 1 revealed a striking elevation in the percentage of DFI when comparing patients with spinal

cord injury to controls. This finding is important and may account for a significant component of the fertility impairment observed in men with spinal cord injury. The underlying mechanism is not entirely clear and is worthy of further study. The two experiments that followed revealed less intuitive findings. Based on their results from experiment 2, the authors concluded that period of abstinence is not associated with percentage of DFI. In some respects, this finding is consistent with a previous report by Sonkson et al that revealed no change in overall sperm quality, despite repeated ejaculations weekly over a 12-month period of time in men with spinal cord injury (Sonkson et al, 1999). In experiment 3, the authors found no difference in percentage of DFI between neat and processed semen samples. The authors rightly observe that cytokines or other chemical mediators expressed by leukocytes or dead sperm may have already exerted their deleterious effects before semen processing, resulting in lasting impairment in sperm DNA quality.

In summary, this series of thoughtful experiments adds to our understanding of the reproductive pathophysiology seen in males with spinal cord injury. The mechanism responsible for the markedly elevated sperm DNA damage in these men is unclear, although elevated levels of leukocytes and dead sperm in the reproductive tract may play a role. This issue certainly deserves further investigation. Finally, additional studies assessing for pregnancy outcomes in men with spinal cord injury stratified by percentage of DFI will provide valuable insight into the ultimate impact of this phenomenon on reproductive potential.

Robert E. Brannigan, MD
Associate Professor of Urology
Northwestern University, Feinberg School of Medicine
Chicago, Illinois

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