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The Relationship Between Human Semen Characteristics and Sperm Apoptosis: A Pilot Study

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This work was undertaken to explore the association between human semen characteristics and apoptosis in ejaculated sperm. We collected semen samples from 23 consecutive male patients who presented to the Andrology Laboratory at Massachusetts General Hospital (MGH) for routine semen analysis. Sperm concentration and motility were measured using computer-assisted sperm analysis. Morphology was assessed using Tygerberg strict criteria. The DNA diffusion assay was used to assess the percentage of apoptosis in ejaculated sperm. In this assay, cells were mixed with agarose and placed into a microgel on a microscopic slide. The cells were stained with YOYO-1 dye, and apoptotic cells were viewed under a fluorescent microscope. Among 23 men, the mean (SD) sperm concentration, percent motility, percent progressive motility, and normal morphology were 125.5 (92.3) million/mL, 45.6% (22.2), 28.4% (15.2), and 8.0 (4.6), respectively. The mean (SD) percent of apoptosis in ejaculated sperm was 8.3% (6.2) with a range from 1.1% to 20.1%. There were inverse associations between percent apoptosis and sperm motility ($P = .0025$), progressive motility ($P = .0051$), and morphology with a normal or good pattern of fertilization by Kruger strict criteria ($P = .0045$), and a positive relationship between percent apoptosis and sperm tail defects ($P = .0053$). In ejaculated semen, the percent sperm apoptosis was associated with several measures of semen quality.

Key words: Semen quality, sperm motility, sperm morphology, DNA diffusion assay

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