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LETTER TO THE EDITOR

Comment on Winke T et al. J Assist Reprod Genet DOI 10.1007/S10815-008-9277-3

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In a recent original contribution paper by Winke and colleagues published in JARG [1], the authors examine the association between male age and sperm DNA integrity as a potential co-factor affecting fertility. Based on basic semen analysis and DFI measurement via PI staining, they conclude that there is no direct age effect in sperm parameters, neither in normal (340) nor in control (84) individuals. In the discussion section, the authors attribute this contradictory finding to several causes. In particular, with regard to the study by our group [2], they attribute our positive correlation outcome to the limited patient sample used and the application of the TUNEL assay. As to the first suggestion, it is a classic concept in biostatistics that limited sampling may decrease study power, rendering it harder to exhibit existent differences among compared groups (hence the term ¨statistically indicative¨ used to describe findings with a p value between 0.1 and 0.05, which could have been shown to be statistically significant if a bigger sample was used to limit standard error). However, the opposite cannot be true and, thus, if a difference reaches statistical significance despite the small study sample, this is only indicative of its considerable extension. As far as the use of the TUNEL assay is concerned, this is a classic molecular technique used to detect apoptotic cells due to their special feature of DNA strand breaks. It is true that some partial or localized strand breaks may not be detected by TUNEL (although, to our knowledge, there is no large scale head to head comparative study between the various DNA fragmentation estimation assays using the same reference sample) but these would normally not be expected to cause significant effects in the clinical setting. Therefore, we think it is important to distinguish between pro-apoptotic fragmentation, which may be predictive of fertility potential and seems to be age-dependent and overall DNA integrity status, which also includes minor distortions, possibly present in all age groups and potentially counteracted by housekeeping mechanisms. As far as sperm concentration is concerned, it is evident that this is largely affected by accessory gland function, which is known to be age-(and androgen-) dependent, although numerous environmental factors (e.g. drugs, hydration status, infections) may also affect this parameter. To conclude, it is our belief that DNA fragmentation is an important factor when attempting to evaluate sperm quality and fertility potential in an infertile couple. However, its estimation requires sophisticated techniques to distinguish baseline and excessive activity, which hinders generalized application as part of routine assessment in infertility clinics at present.

Editor's note: The traditional use of the TUNEL assay is being seriously questioned as a marker of apoptotic programmed cell death and as the above commentary suggests, measures of sensitivity pertaining to different degrees of DNA damage are often difficult to ascribe. Stay tuned for the array of assays becoming available for discriminating subtle and/or severe degrees of DNA damage in gametes and embryos will be the subject of an upcoming minireview.

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References

1. Winke T, Rosenbusch B, Gagsteiger F, Paiss T, Zoller N. The correlation between male age, sperm quality and sperm DNA fragmentation in 320 men attending a fertility center. J Assist Reprod Genet. In press.
2. Plastira K, Msaouel P, Angelopoulou R, Zanioti K, Plastiras A, Pothos A, et al. The effects of age on DNA fragmentation, chromatin packaging and conventional semen parameters in spermatozoa of oligoasthenoteratozoospermic patients. J Assist Reprod Genet. 2007;24:437–43. doi:10.1007/s10815-007-9162-5.