Editorial

Elevated sperm DNA fragmentation levels result in detrimental effects on natural and assisted reproductive outcomes per a review of the medical literature

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Comment on: Farkouh A, Salvio G, Kuroda S, *et al.* Sperm DNA integrity and male infertility: a narrative review and guide for the reproductive physicians. Transl Androl Urol 2022;11:1023-44.

Submitted Oct 12, 2022. Accepted for publication Nov 17, 2022.
doi: 10.21037/tau-22-673
View this article at: https://dx.doi.org/10.21037/tau-22-673

Farkouh *et al.* have written a comprehensive narrative regarding sperm DNA fragmentation (SDF) with systematic reviews and meta-analyses as the basis for their discussion (1). Diagnostic semen testing with enough evidence to support its use has not significantly advanced since spermatozoa were first identified microscopically by Antony van Leeuwenhoek in the mid-17th century until SDF assays (2). Although the conventional semen analysis remains as the cornerstone of the male fertility evaluation, it is a crude assessment from the standpoint of not offering functional information about spermatozoa. Adjunct testing to understand the function of spermatozoa is crucial in the progression of male infertility evaluation and treatment, and to date, SDF is the functional assay that has gained the most evidence to be used as an adjunct to the conventional semen analysis in certain clinical scenarios. The authors of this manuscript elegantly review the pathophysiology of SDF, the different assessment tools of SDF, the treatment options for infertile men with elevated SDF levels and perform a strength, weaknesses, opportunities, and threats (SWOT) analysis of the current research on SDF.

The authors review data supporting the concept that high levels of SDF are found in infertile men and with particular risk factors for infertility (3,4). They also emphasize the evidence that high levels of SDF have been inversely correlated with outcomes of spontaneous pregnancy and assisted reproduction outcomes. The limitations of using SDF in the assessment and decision making for infertile men are adequately discussed including the lack of standardization of SDF assessment techniques. Another challenge in using SDF to guide treatment of infertile men is the lack of clear reference ranges for normal and abnormal, which are not defined by the World Health Organization (5) 6th edition manual (5). The authors suggest 20% as a reasonable cutoff value based on the available data in the literature (3,6,7). There is clearly a role and utility for SDF assessment in specific infertile men. Per the American Urological Association/American Society for Reproductive Medicine guidelines, SDF testing should not be recommended for the initial evaluation of the infertile couple, but it is recommended for couples with recurrent pregnancy loss (8). Larger prospective controlled studies are needed to further define the use of SDF in infertile men, but there is a potential for expansion of the role SDF and its use. A previous systematic review and meta-analysis suggested a benefit of SDF testing in men with unexplained infertility, recurrent pregnancy loss, varicocele, and for those opting for assisted reproductive technology with risk factors for SDF elevation (6). The current manuscript is an excellent summary of the data currently available to

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reproductive clinicians on SDF.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Translational Andrology and Urology*. The article did not undergo external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at https://tau.amegroups.com/article/view/10.21037/tau-22-673/coif). The author declares he is on the speaker bureaus for Halozyme Therapeutics and Acerus Pharmaceuticals which are not relevant to this work.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Cite this article as: Kavoussi PK. Elevated sperm DNA fragmentation levels result in detrimental effects on natural and assisted reproductive outcomes per a review of the medical literature. Transl Androl Urol 2022;11(11):1484-1485. doi: 10.21037/tau-22-673

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