Foreword

Sperm DNA integrity: from 'promising' to standardization

Human assisted reproduction results have improved dramatically in the last 20 years, with lower complications for the patient as well as for the newborns. This requires a precise clinical diagnosis that will allow us to individualize the best-personalized treatment for each patient or couple. But still today, the basic diagnostic test for the male is a conventional sperm analysis, even though it has been extensively discussed the difficulties that this simple test reveals to discriminate between fertile and infertile individuals.

One of the male diagnostic tests that has been developed a few years ago was the analysis of the sperm DNA integrity. Due to the controversy generated by the published evidence by different research groups, with diverse subgroup of patients being analyzed, and often with different methodologies, still it has not been implemented as a routine test in most ART labs across the world, and its use has not been supported by scientific societies yet.

Sperm DNA integrity defects are related with spermatogenesis alterations, varicocele, inflammatory processes and with an increase in post-testicular oxidative stress. Thus, it represents a functional diagnostic test that may complement conventional sperm analysis. From the clinical point of view, increased sperm DNA fragmentation has been correlated with suboptimal embryo development, implantation failure and recurrent miscarriage.

A relevant step in the validation as a diagnostic test is to standardize the different methodologies existing nowadays that would allow comparing clinical results among groups and publications. It is required to select among the techniques one as "gold standard" for each different type of DNA damage to be evaluated. This process of standardization would allow a better discrimination of the different processes that may induce an increased sperm DNA fragmentation in the patient, and thus, individualize treatment protocols for the different types of DNA damage. It may help clinicians to select which patients may benefit from oral antioxidants therapy, select candidates for varicocelectomy, or those who may benefit from micro-TESE in severe oligozoospermia with post-testicular oxidative stress.

One step further would imply to use this technology to identify sperms with unfragmented DNA and directly being selected for ICSI. New technologies as Raman spectroscopy are being developed, although still experimental.

We are witnessing the transformation of the sperm DNA integrity study as "a promising diagnostic test" to a valid clinical indication. Still, standardization of the "gold standard" technique to investigate sperm DNA fragmentation is urgently needed, a test that could improve identification of the functional sperm defects, which may help to establish individualized therapeutic protocols, and at the end, to improve reproductive outcome.

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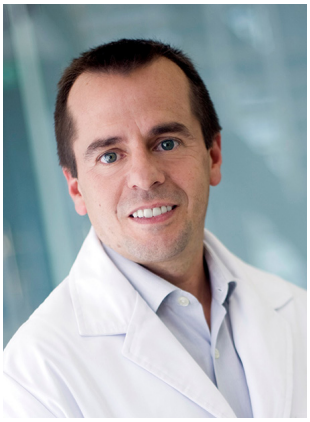

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