Impact of sperm DNA fragmentation on reproductive outcome following IVF and ICSI: a retrospective analysis of 406 cases

Christensen P1, Sils ES2-4, Fischer R2, Naether OGJ2, Walsh D1, Rudolf K1, Coull G1, Baukloh V1, Labouriau R5 and Birck A1

1 SPZ Lab A/S, Fruebjergvej 3, DK-2100 Copenhagen OE. Denmark  2 Fertility Center Hamburg, Spreeort 4, 20095 Hamburg, Germany  3 Sims IVF, The Sims Building, Clonskeagh Rd., Clonskeagh, Dublin 14, Ireland.  4 Division for Reproductive Endocrinology, Pacific Reproductive Center, Irvine CA 92618, USA.  5 Aarhus University. Department of Molecular Biology and Genetics, Center for Quantitative Genetics and Genomics, Gustav Wiels Vej 10, DK:Aarhus C, Denmark.

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Study question: Currently, no published data describes the impact of sperm DNA fragmentation on the outcome of IVF and ICSI treatments in a typical population of women seen by fertility centers where no selection with regard to age or body mass index (BMI) is possible.

Summary answer: A significant negative effect on the reproductive outcome of IVF and ICSI treatments was seen when the sperm DNA fragmentation index (DFI) was above 15% and 25%, respectively.

What is known already: Bungum et al. (Human Reproduction 2007;22:174-179) reported that IVF and ICSI were equally successful when DFI was below 30. Interestingly, when DFI was above 30, ICSI results were significantly better than IVF. That study only included women under the age of 40 years (average 31.6) and with BMI below 30.

Study design, size, duration: This retrospective study reviewed non-donor IVF and ICSI clinical records and corresponding laboratory data. Outcome of the first treatment cycle was included in the data. Thresholds for DFI of 15 and 25 were used for IVF and ICSI, respectively. Effect on outcome below and above the threshold was analyzed.

Main results and the role of chance: In the IVF group, all DFI values were below 25 (according to the recommendation after the SDI test result). In the ICSI group, DFI values varied up to 61.2. Clinical pregnancy rate was 37.6% (79/210) for first cycle IVF treatments. The clinical pregnancy rate was 45.1% when DFI was below 15, and diminished to 24.6% when DFI was between 15 and 25. Odds ratio adjusted for female age was 2.63 (95% CI 1.36-5.11), P=0.0014. For first cycle ICSI treatments, the average clinical pregnancy rate was 40.8%. When DFI was below 25, the success rate was 48.7%. Above this threshold, the clinical pregnancy rate was 29.6%. Odds ratio adjusted for female age was 2.15 (95% CI 1.14-4.05), P=0.0045.

Further information: Please contact corresponding author P. Christensen on mail: pc@spzlab.com or phone: +45 39 17 97 84

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