ESHRE 41st Annual Meeting

P-030. Sperm Samples with elevated Double-Strand DNA Fragmentation demonstrate similar fertilization outcomes to Low Fragmentation when treated: A Retrospective Analysis of egg donor cycles with PGT-A.

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Study question

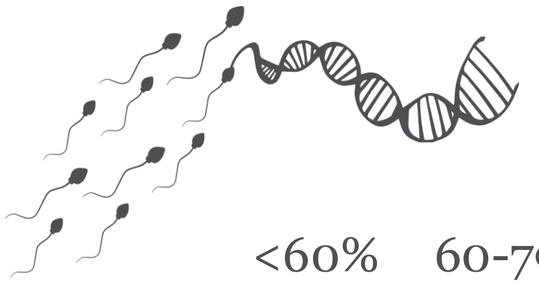
Does the presence of high double-strand DNA fragmentation (≥60%) in sperm samples significantly compromise fertilization, blast formation, and overall euploidy rates in egg donation cycles?

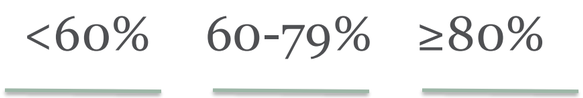
What do we know?

Elevated DNA fragmentation in sperm has long been suggested to impair embryo quality and reduce reproductive outcomes. Double-strand (DS) DNA breaks, in particular, is believed to have a more deleterious effects than single-strand breaks on fertilization, blastocyst formation, and embryo ploidy. Prior studies suggest that higher DS fragmentation may increase aneuploidy rates or reduce implantation success. However, the clinical impact of moderate or even very high DS fragmentation remains debated. In many assisted reproduction laboratories, sperm selection techniques are implemented when DS fragmentation surpasses certain thresholds, yet robust prospective data remain scarce.

Materials and Methods

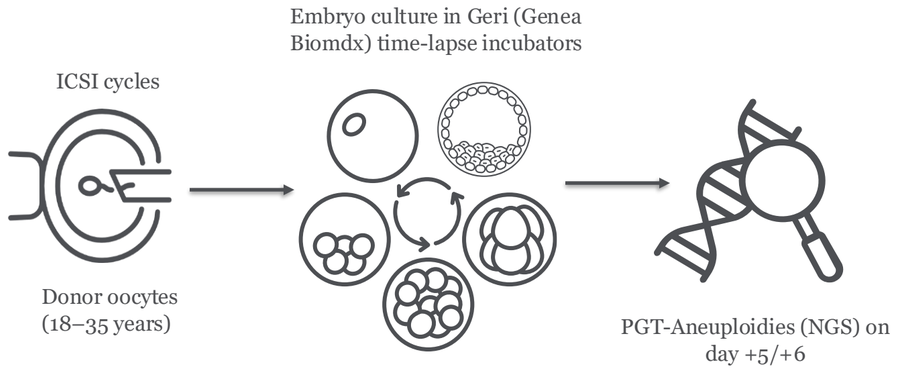
A retrospective study. Examined 303 donor-oocyte cycles performed at a single fertility center between January/2022-December/2024.





Sperm selection depending on fragmentation levels

*With frozen samples always sperm slow independent on fragmentation levels.



Statistical comparisons were performed via ANOVA and linear models.

Main Results

Double-stranded fragmentation was tested with the **Comet assay** and were classified into three groups:

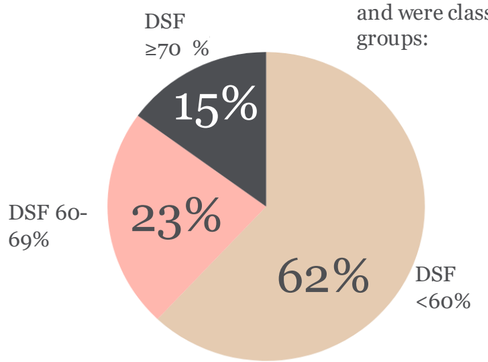


Figure 1. Percentage of fragmented samples among different fragmentation levels .

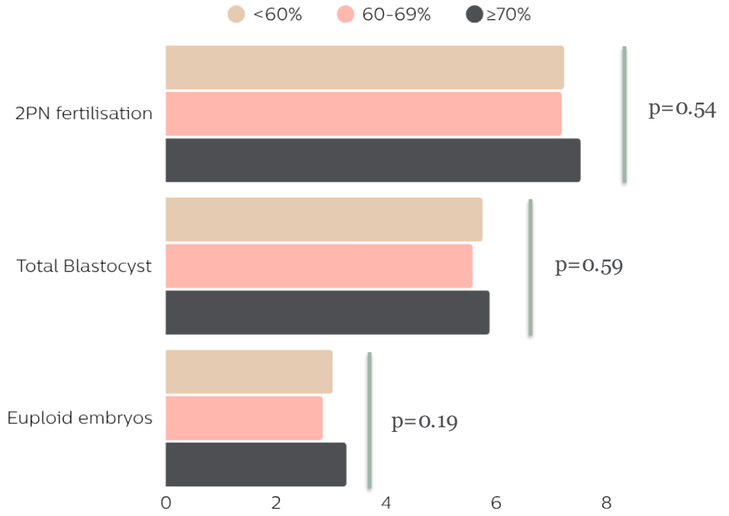


Figure 2. Number of 2PN fertilised metaphase II oocytes, total blastocysts and euploid embryos for each fragmented group.

Aneuploid rates similarly did not differ, and mosaic rates remained constant among groups. The overall model R-squared was consistently low (<2%), indicating neither fragmentation level nor age accounted for substantial variation in these embryologic endpoints.

Conclusions

These findings suggest that sperm samples with elevated DS fragmentation have similar fertilization outcomes or chromosomal status within egg-donation cycles when treated with additional sperm-selection techniques.

As a retrospective analysis from a single center, the possibility of confounding by unmeasured variables cannot be ruled out. This study focused on egg donation cycles, which may not fully generalize to own-egg IVF. Although selection techniques were standardized, randomized trials and larger cohorts are needed to confirm these findings.