

THE DIRECT SWIM-UP TECHNIQUE: A SIMPLE AND HIGHLY EFFECTIVE METHOD TO OPTIMIZE MOTILITY AND PRESERVE SPERM DNA INTEGRITY

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INTRODUCTION

Emerging evidence suggests that certain sperm preparation techniques—particularly those that avoid centrifugation—can more effectively isolate spermatozoa with lower levels of DNA fragmentation compared to traditional density gradient methods.

AIM OF THE STUDY

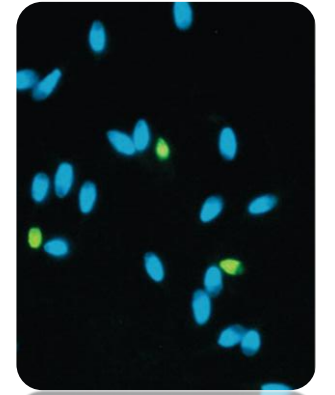
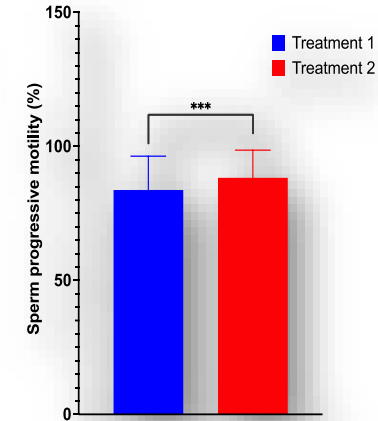
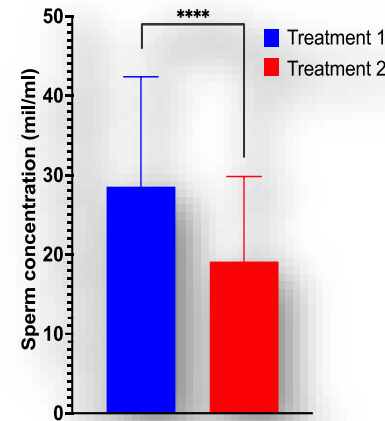
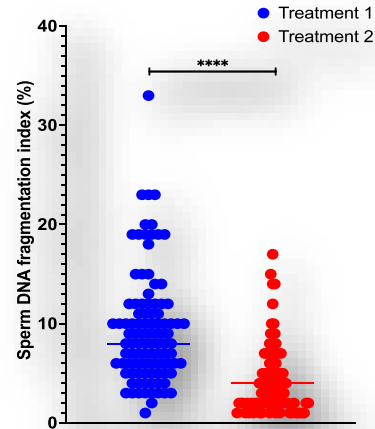
To evaluate the effects of two sperm preparation methods—swim-up and direct swim-up (without centrifugation)—on sperm DNA integrity in patients undergoing fertility assessment.

METHODS

100 patients (mean age: 40.05 ± 7.7 years) were included, and their semen samples were divided into two aliquots and treated with two methods:

- Treatment 1) swim-up after washing with centrifugation
- Treatment 2) direct swim-up without centrifugation.

Sperm concentration, motility, and DNA fragmentation were compared between the two groups.



RESULTS

- Treatment 2 significantly reduced sperm concentration compared to Treatment 1 (19.11 ± 10.7 million/ml vs. 28.5 ± 10.9 million/ml; $p < 0.0001$).
- Progressive motility was significantly higher in Treatment 2 than in Treatment 1 (88.26 ± 10.3 % vs. 83.7 ± 12.6 %; $p = 0.0001$), showing an improvement in progressive motility relative to the fresh semen sample values (40.0 ± 8.9 % for Treatment 2 vs. 35.5 ± 10 for Treatment 1).
- Treatment 2 significantly reduced the percentage of sperm with DNA fragmentation (4.4% vs. 9.5%; $p < 0.0001$).
- Additionally, five samples exhibited DNA fragmentation levels above the laboratory-defined cut-off ($\geq 20\%$) following Treatment 1, whereas no samples showed positive DNA fragmentation results after Treatment 2.

CONCLUSIONS

The direct swim-up method demonstrated enhanced progressive motility and a reduction in sperm DNA fragmentation compared to the centrifugation-based swim-up technique. These findings suggest its potential prognostic value for in vitro fertilization (IVF) cycles without add-on sperm selection treatments. Future studies should focus on standardizing this technique for oligozoospermic patients and assessing both laboratory and clinical outcomes in assisted reproductive technology (ART) cycles.



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