

MORPHOLOGY AND MOTILITY BASED SPERM SORTING TECHNIQUE WITHOUT CENTRIFUGATION MAY IMPROVE TREATMENT OUTCOMES AFTER PREVIOUS FAILURES

Yael Harir, Rona Halevy Amiran, Yuval Or

Fertility and IVF unit, department of gynecology, Kaplan Medical Center

Introduction

Several sorting techniques are used in IVF treatments in order to select motile sperm cells from the semen samples.

Swim-up (SU) technique sort the sperm cells by motility, and Density Gradient Centrifugation (DGC) sort them by morphology, using centrifugation. These common techniques are used according to the WHO recommendations and usually efficient, but at the same time may be the cause for poor treatments outcomes. SU technique do not provide morphology sorting, and DGC technique, using centrifugation, may cause DNA fragmentations, which is associated with low fertility rate and poor quality embryos.

A new device was developed to provide an alternative processing technique that combines sperm sorting by morphology and motility - centrifugation free.

Our aim was to examine whether the new sperm sorting technique improves the treatment outcomes among patients with several unexplained previous failures cycles (when sperm samples were processed using common techniques). For this purpose, ZyMöt device was used for sperm preparation in 25 cases of patients with two or more previous failure cycles.

Results

Four parameters were compared between 25 cases using ZyMöt and general IVF cycles in our laboratory. Fertilization rate was 62.3% vs 53.3%, day 3 embryo development rate was 93.5% vs 79.1%. Blastocyst development rate was 50.2% vs 31.2% and pregnancy rate was 47.3% vs 36.8%. All parameters tested were significantly increased compared to previous treatments, as shown in the table below.

% Pregnancy	% Blastocyst development	% Day 3 embryo development	% Fertilization	
36.84	31.23	79.15	53.36	IVF general cycles
47.37	50.22	93.54	62.36	ZYMot cycles



Discussion

Sperm preparation/separation based on morphology and motility without centrifugation, using the ZyMöt device, seems to be an excellent technique leading to better treatment outcomes in patients with previous failures. Since the use of centrifugation have a adverse effect on sperm function that affects later on fertility, embryo development and pregnancy rate, using the ZyMöt device without centrifugation may be beneficial.

References

1. Ali A.H, Ajina T., Ben Ali M., Mehdi M. **Efficacy of density gradient centrifugation technique (DGC) in enhancing sperm cell DNA quality for assisted reproductive technique** (2022). Middle East Fertility Society Journal 27:22
2. Pinto S., Carrageta D.F, ,Alves M.G, Rocha A., Agarwal A., Barros A., Oliveira P.F. **Sperm selection strategies and their impact on assisted reproductive technology outcomes** (2021) Andrologia 53:e13725
3. Dehghanpour F., Ali Khalili M., Mangoli E., Talebi A.R., Anbari F., Shamsi F., Woodward B., Doostabadi M.R. **Free centrifuge sorting method for high-count sperm preparation improves biological characteristics of human spermatozoa and clinical outcome: A sibling oocytes study** (2022) Andrologia 54:e14554.
4. Amano K., Oigawa S., Ichizawa K., Tokuda Y., Unagami M., Sekiguchi M., Furui M., Nakaoka K., Ito A., Hayashi R., Tamaki Y., Hayashi Y., Fukuda Y., Katagiri Y., Nakata M., Nagao K. **Swim-up method is superior to density gradient centrifugation for preserving sperm DNA integrity during sperm processing** (2024) Reproduction Medicine Biology. ;23:e12562.

Contacts

Y.harir@clalit.org.il, Ronaha@clalit.org.il, Yuval_O@clalit.org.il