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Pregnancy outcomes of intrauterine insemination using microfluidics ZyMot device for patients with high sperm DNA fragmentation.

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INTRODUCTION

Semen analysis examines key sperm parameters such as concentration, motility and morphology but it lacks the molecular aspect which in some cases can be the cause of male infertility issues.[1] One of these aspects is sperm DNA fragmentation (SDF) which can be caused by several factors such as oxidative stress.[2] The correlation between SDF and intrauterine insemination (IUI) pregnancy rates is still under scope. Different methods of sperm preparation can be used to improve IUI outcomes. Even though microfluidics method ensures more refined sperm selection with better motility and lower fragmentation rate, its utility for IUI is uncertain.[3]

AIM

- Investigate the effect of microfluidics ZyMot sperm preparation on IUI pregnancy outcomes in patients with high DNA fragmentation (>20%)
- Compare sperm characteristics post-preparation

METHOD

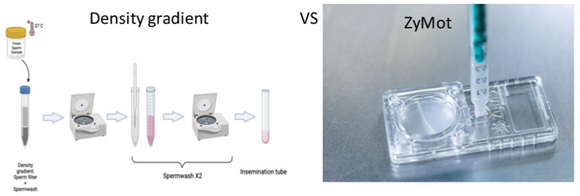
- **Study Type:** Retrospective Cohort
- **Patients:** 132 couples undergoing IUI (Dec 2022 - Dec 2024)
- **Sperm Selection Methods Compared:**
  - **ZyMot (50 patients)**
  - **Density Gradient (82 patients)**

Inclusion:

✓Male partner SDF ≥20% (tested less than 6 months prior to IUI)
✓Fresh semen samples
✓ Female partner age <43, tubal patency confirmed

Exclusion:

X OATS
X Frozen sperm samples



RESULTS

Table 2 : Post-preparation semen analysis parameters and pregnancy rates of two groups

	Zymot (n=50)	Gradient (n=82)	p-value
Final concentration (mil/ml)[a]	40.4±51.8	103±92.0	<0.001*
Final motility (%)[a]	97.7±12.7	86.2±15.2	<0.001*
TSM (mil)[a]	22.0±26.2	51.6±55.6	<0.001*
PR (%)[b]	8	9.7	0.74
Miscarriage (%)	50	12.5	<0.001*

a: Student t-test (mean±standard deviation)

b: Chi-square test

*: significant difference

TSM: total sperm motiility

PR: pregnancy rate (biochemical+clinical)

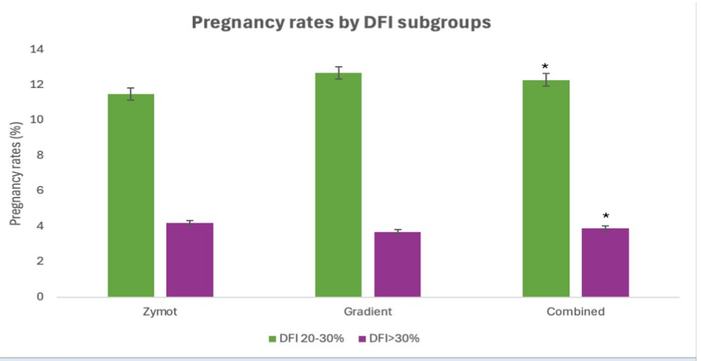


Figure 2 Column chart representing pregnancy rates for different sperm preparation groups and both of them combined together depending on DFI severity between 20% and 30% and more than 30 %. The chi-quare test was assessed for statistical significance determination represented by *p≤ 0.05.
DFI: DNA fragmentation index

Main Findings:

✓ ZyMot did not improve IUI pregnancy rates.
✓ Higher SDF (>30%) correlated with lower pregnancy rates.

Clinical Recommendations:

✓ IUI is not the best option for patients with SDF >30%.
✓ ZyMot has potential for IUI but needs further study.

CONCLUSIONS

The use of ZyMot for sperm preparation in IUI cycles for patients with high DNA fragmentation does not increase pregnancy rates as compared to conventional density gradient wash. Moreover, the findings suggest that when sperm DNA fragmentation exceeds 30%, direct passage to IVF should be considered to optimize reproductive success.

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