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SINGLE IUI IN PATIENTS USING DONOR SPERM RESULTS IN EQUIVALENT PREGNANCY OUTCOMES COMPARED TO DOUBLE IUI

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OBJECTIVE:

Patients using donor sperm for intrauterine insemination (IUI) might be counseled to undergo double IUI to increase exposure to sperm. While a double IUI approach has not been shown to improve outcomes compared to single IUI in the general population, patients using donor sperm such as same-sex female couples and single mothers by choice lack supplementary access to partner sperm around the time of ovulation.¹ However, sperm banks worldwide are currently facing a shortage of donor sperm, and double IUI increases cost and inconvenience to the patient. The objective of this study is to determine whether pregnancy outcomes resulting from single IUI are equivalent to those following double IUI in patients using donor sperm.

MATERIALS AND METHODS:

This retrospective cohort study included all patients undergoing IUI cycles using donor sperm (DIUI) from 2002 to 2021. Patients underwent natural or oral medicated cycles with clomiphene citrate or letrozole. HCG trigger was given when at least one follicle ≥ 18 mm was seen on ultrasound. Patients who underwent two consecutive IUIs (double DIUI) were compared to those who underwent one IUI (single DIUI). Primary outcomes were pregnancy (HCG ≥ 2.5 IU/L) and clinical pregnancy (visualization of a gestational sac on ultrasound). Chi square and Student's t-test were used for analysis, with multivariable logistic regression to control for confounders.

RESULTS:

A total of 5294 donor sperm IUI cycles were identified, including 2863 single DIUI and 2431 double DIUI cycles. The decision of whether to undergo double vs. single DIUI was influenced by patient and physician preference. Significant differences were seen between the single and double DIUI groups in age (37.5 ± 4.7 vs. 38.7 ± 4.3 , $p < .0001$), BMI (26.3 ± 5.7 vs. 25.5 ± 5.1 , $p = .008$), AMH (3.01 ± 3.22 vs. 2.34 ± 2.28 , $p = .009$), gravidity (0.46 ± 0.84 vs. 0.76 ± 1.12 , $p < .0001$), and parity (0.15 ± 0.50 vs. 0.22 ± 0.53 , $p = .0002$). Single compared to double DIUI cycles had a lower proportion of oral medication use (51.0% vs. 54.6%, $p < .0001$) and a lower average number of follicles ≥ 18 mm (1.29 ± 0.73 vs. 1.43 ± 0.88 , $p < .0001$). On univariate analysis, pregnancy rate and clinical pregnancy rate were significantly higher among the single compared to double DIUI group (14.2% vs. 11.9%, $p = .02$; 11.3% vs. 9.2%, $p = .01$). Controlling for age, AMH, BMI, gravidity, parity, endometrial thickness, medication use, and number of follicles at surge, no differences in pregnancy and clinical pregnancy rates were seen when comparing single vs. double DIUI (Pregnancy: aOR=0.52, 95% CI 0.21-1.30, $p = .16$; Clinical pregnancy: aOR=0.51, 95% CI 0.18-1.45, $p = .21$).

CONCLUSIONS:

In an era of precision medicine where big data allows us to define patient journeys and optimize efficiency and efficacy, we have shown conclusively that a single DIUI is equivalent to double DIUI in pregnancy outcomes.



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IMPACT STATEMENT:

A single well-timed insemination is preferable to two among patients using donor sperm, as this strategy reduces the physical, emotional, and financial burdens of treatment without compromising success rates.

REFERENCES:

1. Bagis T, Haydardedeoglu B, Kilicdag EB, Cok T, Simsek E, Parlakgumus AH. Single versus double intrauterine insemination in multi-follicular ovarian hyperstimulation cycles: a randomized trial. *Hum Reprod.* 2010 Jul;25(7):1684-90. doi: 10.1093/humrep/deq112. Epub 2010 May 10. PMID: 20457669.