



REEVALUATION OF THE CLINICAL IMPORTANCE OF EVALUATING SPERM MORPHOLOGY USING STRICT CRITERIA

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Several studies suggest that sperm with $\leq 4\%$ normal morphology (NM) using strict criteria are subfertile and IVF with ICSI may be needed. However, not all studies agree on the clinical importance of the use of NM with strict criteria. One study of males with oligozoospermia found a lower pregnancy rate (PR) following intercourse with sperm with NM $> 14\%$ compared to specimen with $\leq 4\%$. The study presented herein evaluated the efficacy of intrauterine insemination (IUI) according to NM using strict criteria. The clinical PRs for first IUI cycles were 30% (28/91) for 0–4% normal forms, 26% (71/268) for range of 5–14%, and 20% (11/53) for $> 14\%$. This study corroborates previous data with intercourse only, suggesting that sperm with NM $\leq 4\%$ using strict criteria are not necessarily associated with lower fecundity.

Keywords ICSI, IVF, pregnancy, sperm morphology, strict criteria

Several studies suggest that the 4% level using strict criteria for morphology separates fertile from subfertile sperm [3, 4, 6–8]. However, not all studies agree on the clinical importance of measuring normal morphology (NM) [1, 5]. One in vivo study found that with normal motile densities (MD) there was a trend for higher pregnancy rates (PRs) when the strict morphology was $> 14\%$ compared to those $\leq 4\%$ [1]; however, in that same study, when MD was subnormal, the group with $\leq 4\%$ showed a trend for higher PRs than the group with $> 14\%$ NM [1]. Thus, this study, which evaluated pregnancies following only intercourse and not intrauterine insemination (IUI), found that measuring sperm morphology using strict criteria was not particularly valuable in determining the fertility potential of a given semen sample [1].

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The study presented here attempted to corroborate or refute the aforementioned study, only this time using IUI rather than intercourse as the method to try to achieve pregnancies.

MATERIALS/METHODS

A retrospective evaluation of 412 first IUI cycles of 412 patients was performed. The reason for performing IUI may have been related to a subnormal semen specimen, poor postcoital test, or unexplained infertility. The sperm was processed as follows: Liquefied semen was diluted 1:1 with modified HTF medium (Irvine Scientific). Then 1–2 mL of gradient was placed in a 15-mL conical centrifuge tube and overlaid with up to 2 mL of diluted semen. The columns were centrifuged for 20 min at 300g. The upper semen layer was removed after centrifugation and discarded. Using a new pipet, the pellet was removed and washed 2 times for 5 min at 300g using HTF. The final pellets were resuspended to 0.5 mL for insemination. The hypoosmotic swelling test (HOST) was performed [2]. The timing of the IUI was determined by having the patient begin urinary luteinizing hormone (LH) monitoring every 5 h once the ovarian follicle size determined by pelvic sonography approached 17 mm and the serum estradiol level approached 200 pg/mL. Intrauterine insemination would then be performed approximately 40 h later. Some patients taking follicle maturing drugs or having natural cycles but where the follicle was deemed mature without an LH surge as yet were given 10,000 units of human chorionic gonadotropin (hCG) and IUI was performed 40 h later. Only cases where oocyte release was documented by sonography prior to IUI were included.

Clinical PRs per IUI cycle were then determined according to the same subdivided groups described in the original manuscript based on intercourse (0–4%, 5–14%, >14%). A clinical pregnancy was defined by the demonstration of a gestational sac by sonography.

RESULTS/DISCUSSION

The clinical PR per IUI cycle was 30% (28/91) for those with normal strict morphology 0–4%, vs. 26% (71/268) for those with a 5–14% score, and 20% (11/53) for those with scores >14% ($p = \text{NS}$). These results were not based on a greater number of motile sperm used for the IUI in the group with the worst NM, since this number increased with higher percentage NM (Table 1).

Table 1. Mean total motile sperm used for intrauterine insemination according to strict criteria

	NM 0–4% inclusive ($n = 91$)	NM 5–14% inclusive ($n = 267$)	NM > 14% ($n = 53$)
Total motile sperm in initial specimen ($\times 10^6$)	(0.24–373) 18	(0.6–387) 36	(1.08–417.6) 79
Total motile sperm in specimen used for IUI	(0–35.28) 3.12	(0–88.40) 7.6	(0.25–127.8) 16
Total motile sperm recovered	(0.18–373) 13.4	(0–382) 27	(0–342) 50
% motile sperm recovered ($\times 10^6$)	(10–100%) 84	(17–100%) 79	(0.1–76%) 76

Similar to the previous study that evaluated the effects of percentage NM using strict criteria but following normal intercourse, as a generality, the existence of low-percentage NM does not seem to lower fecundity. This does not mean that for some individuals poor morphology does not result in a subfertile specimen. One way to assess this possibility would be to look at the cumulative probability of pregnancy to see if failure to conceive following many IUI cycles may be related to poor morphology. With very respectable PRs following IUI with sperm with low morphology on the first cycle, it would seem reasonable to try IUI before proceeding to IVF when the male partner demonstrates sperm with asthenozoospermia.

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