In the name of God

Outcome of IUI Based on Sperm Morphology in Cases of Unexplained and Male Factor Infertility.

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Abstract:

Background:
Objective: To evaluate the effects of sperm morphology on the success rate of IUI.
Methods: This was a prospective study of 200 couples who underwent IUI in order to improve the likelihood of conception. The patients were divided into 2 groups, one consisting of 100 patients with a normal sperm morphology of ≤20%, and the other consisting of 100 patients with a normal semen morphology of >20%, and an otherwise normal semen analysis.
Results: A total of 59 clinical pregnancies were obtained for a pregnancy rate / cycle of 10.5%. No significant differences were found between the two groups examined.
Conclusion: There are no substantial differences in the success of intrauterine insemination when normal sperm morphology in semen analysis is more than 20% compared to when it is less than 20%.

Keywords: Male factor infertility, IUI, Clomiphene

Synopsis: There are no substantial differences in the success of intrauterine insemination when normal sperm morphology in semen analysis is more than 20% compared to when it is less than 20%.

Introduction:

Intrauterine insemination is recognized as an effective and inexpensive method of assisted reproductive technology (ART), which is generally attempted before proceeding to more invasive assisted reproductive techniques such as in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI).

IUI is appropriate for treating a wide variety of infertility issues such as, endometriosis, male infertility, anovulation, and cervical antisperm antibody related infertility[1, 2], as well as infertility due to unknown causes.

Predictive sperm parameters for successful IUI have been controversial, with the minimal recommended proportion of normal sperm morphology inseminated varying from 30% (by WHO reference value) to 4%.[1- 3] The aim of our study is to assess the likelihood of IUI outcomes based on sperm morphology in the case of both unexplained and male factor infertility.

Materials and Methods:

This study took place between January 2007 and November 2008, and examined 200 patients seeking treatment for unexplained infertility (primary or secondary) and male factor infertility (low sperm morphology) at the Department of Infertility at the Zeinabieh Hospital in Shiraz, Iran.

Patients were divided into 2 groups, in group A, 100 patients with normal semen analysis except for low morphology (≤20% before wash) were examined in comparison to group B, which consisted of 100 patients with normal sperm morphology (>20% before wash) but unexplained infertility.

Diagnostic examinations for female patients included physical examinations, hormonal assays, hysterosalpingography, baseline sonography and laparoscopy. Both groups underwent induction of ovulation by clomiphene citrate (CC) with a dose of 100mg 5 – 9 days from of their menstrual cycle. Vaginal sonography was done on the 14th or 15th day of their cycles, and if the response to medication was satisfactory (≥3 follicles with the size of 16-18mm), HCG (10,000U) was injected intramuscularly. IUI was done 24-30 hrs after HCG injection for 3 cycles. If pregnancy did not occur with clomiphene after 3 cycles, human menopausal gonadotropin (HMG, IPSA) was added from the 8th day of next cycle. After satisfactory sonographic results (as mentioned above), HCG (IPSA) was injected and IUI was done 24-36 hrs after that.

Statistical analysis:

A global X2- test was calculated to determine whether there was a statistically significant difference between the 2 groups (P-value < 0.05).

Results:

The mean age of the women in both groups was 25.1± 4.5 years, and the age range was 17-34 years (table 1). The indications for IUI were: unexplained infertility 50% (n=100) & male factor infertility 50% (n=100). There were 561

IUI cycles among 200 patients for which information on age, sperm morphology (before wash) and pregnancy rate / cycle were available. Patients underwent 2 forms of controlled ovarian hyper stimulation: clomiphene citrate + HCG or clomiphene citrate + HMG+ HCG.

From these procedures, a total of fifty nine clinical pregnancies followed from the 561 IUI cycles that occurred in both groups, resulting in an overall clinical pregnancy rate/cycle of 10.5%. Out of the 281 cycles that occurred in group A, 29 resulted in pregnancy, while 30 pregnancies resulted from the 280 cycles that occurred in group B. Table 2 shows the

clinical pregnancy rate / cycle as a function of sperm morphology.

In terms of pregnancy outcome, no significant differences were found between the two groups. In group A, there were 21 live births, 6 spontaneous abortions and 2 ongoing pregnancies, while in group B there were 19 live births, 8 spontaneous abortions and 3 ongoing pregnancies..

Finally, no significant relationships were found between pregnancy/ cycle rate and age (table 3), nor was any significant relationship found between pregnancy rate and number of cycles (table 4).

Table 1- Age distribution between the two groups.

Age (Yera)	A(morph ≤20%)	B(morph >20%)
16-20	19	21
21-25	37	38
26-30	29	25
31-35	15	16
Total	100	100

Table 2- The clinical pregnancy rate / cycle as a function of the sperm morphology.

	Group	
	A	B
Morphology	≤20%	>20%
Cycles	281	280
Pregnancies	29	30
Pregnancy/ cycles	10.3%	10.7%

Table 3- The clinical pregnancy rate according to women's age.

Group (per/cycle) Age (yr)	A (preg/cycle)	B (preg/ cycle)	P value
16-20	4 (7.40%)	4 (6.66%)	Ns
21-25	14 (13.4%)	14 (13.33%)	NS
26-30	9 (11.4%)	6 (8.10%)	NS
31-35	3 (9.73%)	6 (14.3%)	NS

Table 4- The number of pregnancies in relation to number of cycles.

	Group A (Morph ≤20%)	Group B (Morph >20%)	P value
1st cycle	4	2	NS
2nd cycle	11	16	NS
3rd cycle	14	12	NS
Total	29	30	NS

Discussion:

Intrauterine insemination is commonly performed to overcome male factor infertility, as well as to enhance the probability of conception in other cases of infertility.[1, 3] This study sought to evaluate the effects of sperm morphology (before preparation) on the success rate of intrauterine insemination using semen parameters that have been evaluated as accurate predictors of successful intrauterine insemination.

As with most forms of infertility treatment, the success of IUI is largely influenced by the etiology of the infertility and by the quality of the sperm itself.[1-7] Other factors that affect the likelihood of conception are the existence of concurrent infertility issues [7], the age of the female partner and the consistency and quality of her ovulatory cycle. Because of the diversity of infertility etiologies, the majority of studies which have sought to associate sperm characteristics with cycle outcome have also included other infertility issues in their assessment. This is problematic because it has made it difficult to isolate the specific impact that sperm morphology had on conception compared to the other infertility etiologies that were treated in parallel.[6] To complicate matters further, previous studies where the affects of sperm morphology on the success of IUI was evaluated have often produced contradictory results.[1, 6] For example, in one study, the authors concluded that IUI was ineffective for treating male factor infertility when normal sperm morphology was <30%.[6] Other authors have also suggested that when normal sperm morphology is < 30% after preparation, a higher number of motile spermatozoa (a minimum of 5 ×106) should be inseminated to ensure the effectiveness of IUI.(1) However, in another study it was concluded that the success rate of IUI was highest when 14% or more of the sperm had normal morphology, was intermediate with values between 4% and 14%, and was generally poor when fewer than 4% of the sperm was normal.[8] This was similar to findings reported by Lindheim et al (1998) where they found a very low pregnancy rate (1% per cycle) when the sperm morphology score was < 4%.[9] Finally, other investigators have reported comparable pregnancy rates between the two groups [10], highlighting a need for more research in this area. Our study attempts to overcome some of these issues by examining the morphology of semen characteristics specifically as they relate to their effect on pregnancy rates. Based on this, we divided the patients into two groups. In group A,

100 patients with ≤20% normal semen morphology were evaluated in comparison to group B, which consisted of 100 patients with > 20% normal sperm morphology. In total, 59 clinical pregnancies were achieved in both groups after 560 IUI cycles, for a combined clinical pregnancy rate / cycle of 10.5%. Our results failed to show any statistically significant difference in the success of IUI between these two groups, and was consistent with previous reports [1, 6] which have found clinical pregnancy rates of 11.6% (393 couples/714 IUI cycles) (Badawy, 2008) and 12.9% (2564 IUI cycles in couples with male factor infertility) (Wainer & colleagues (2004).

In spite of the conflict in the literature, most evidence, including our own findings does seem to support the use of in vitro fertilization and intracytoplasmic sperm injection when sperm normal sperm morphology in semen analysis is very low (<5%).[7] As a result, we believe that the management of infertility issues must be individualized to meet the specific needs of the couple, and a multitude of factors should be considered in order to optimize the chance of pregnancy.

Conclusion:

In this study, we evaluated sperm morphology as it relates to the success rate of IUI, and no differences success rates were found in patients with male factor infertility (normal semen analysis except for morphology ≤20%) when compared to those who exhibited normal sperm morphology (> 20%).

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