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# **The Probability of Pregnancy and Implantation Rates Are Similar for the First Four Embryo Transfers (ETS) (Fresh or Frozen) Following In Vitro Fertilization (IVF) With Intracytoplasmic Sperm Injection (ICSI)**

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## **Summary**

We studied the probability of pregnancy for up to 4 consecutive ET cycles with ICSI performed for male factor. Transfers could be either fresh or frozen. The clinical pregnancy rate (PR) for the first 4 cycles were similar [44.0% (61/366); 31.9% (44/138); 45.2% (14/31); 44.4% (4/9)]. Delivery rates were also similar. There was a lower PR on the second retrieval vs the first retrieval (47.9% vs 29.1%) but this may be related to most of the second retrievals occurring in the second transfer cycle (67.2%, 31/55); this may be explained by women who were poor responders and required another retrieval without a frozen ET. The majority of transfers in cycle one were fresh whereas cycles 2-4 used primarily frozen-thawed embryos. These data should be helpful for patients requiring IVF with ICSI in deciding to continue with more IVF cycles or consider other options.

## **Introduction**

Though initially some data suggested that intracytoplasmic sperm injection (ICSI) resulted in lower pregnancy rates (PRs) upon subsequent frozen

embryo transfer (ET) (1), later studies showed that this was not true (2,3). Obviously it makes sense that since frozen ET is less intensive, less risky to the female partner, and less expensive, that a second oocyte retrieval should not be performed before the rest of the frozen embryos are transferred. When a patient is given the statistics of a given IVF center it is not clear if one looks at the PR following fresh ET if this number constitutes the large majority of patients having a single ET. If so a couple may want to know before proceeding to a second, third or fourth ET as to what the likelihood of success is having failed to conceive in X number of ETs. To gain this insight, probability of pregnancy was calculated for the first four ET cycles resulting from ICSI irrespective of whether fresh or frozen embryos were used.

## Materials and Methods

All IVF-ET cycles involving ICSI from 1/1/97 through 12/31/99 were reviewed. The starting date was chosen because certain procedural changes were made at that time so that from this time the methodology of transfer technique, day of transfer, policies of assisted hatching were all similar. Patients were excluded if they entered the IVF program before 1997, were using donor oocytes, donor embryos, or gestational carriers, only some of the oocytes were processed by ICSI, if fresh and frozen embryos were transferred on the same cycle, if not all of the cycles used ICSI, and if the patient was  $\geq 40$  years old. No patients were excluded according to baseline serum FSH.

## Results

There were 413 patients who had their first oocyte retrieval during the specified time period and met the selection criteria listed above. Eighty-six of these women went on to have a second retrieval cycle. The results of the ETs from the harvests obtained in these two retrieval cycles were evaluated in this study. These women had a maximum of 4 ETs per oocyte harvest retrieved. The clinical PRs per transfer for the first 4 transfers irrespective if fresh or frozen/thawed embryos were transferred were 44.0% (161/366), 31.9% (44/138), 45.2% (14/31), and 44.9% (4/9) ( $p=NS$ ). The corresponding live delivery rates for these 4 transfers were 37.2% (136/366) 26.8% (37/138), 32.3% (10/31), and 33.3% (3/9) ( $p=NS$ ). The clinical PR and delivery rate per oocyte harvest following the first retrieval cycle was 47.9% (198/413) and 39.7% (164/413) as compared to 29.1% (25/86) and 25.6% (22/86) on the second retrieval cycle ( $p<.05$ ,  $p<.05$ , respectively). When considering fresh transfers only, the clinical PR and live delivery rates following first retrieval were 44.2% (121/274) and 37.6% (103/274) as compared to 33.3% (17/51) and 29.4%

(15/51) for the second retrieval cycle ( $p=NS$ ,  $p=NS$ , respectively). In interpreting these results, it is important to note that 31% of the patients undergoing the first oocyte retrieval and 54.7% of the patients undergoing the second retrieval had 5 or fewer embryos available and thus had only 1 ET. Following both retrievals, approximately 30% of all patients elected to freeze all their embryos and delay transfer to a cycle in which a better uterine environment could be obtained.

## Conclusions

Patients requiring IVF with ICSI can be told that the clinical and viable PRs including fresh or frozen ETs are similar for the first four transfers. The PRs are only slightly lower in those who have failed to conceive in their first oocyte retrieval cycles if a second retrieval is needed. Also, the overall PR including fresh or frozen transfers deriving from a single oocyte harvest were slightly lower if the origin of the oocytes were from the second oocyte retrieval. Hopefully these data will encourage people to continue with IVF with ICSI even if they fail to conceive after 1-3 cycles.

The conclusions reached by this study with IVF with ICSI are similar to conclusions reached with IVF in general that the PRs per transfer do not decrease for the first four ETs (4-14).

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