

DISCUSSION

Successful outcomes after IVF procedures depends on many factors, one of the most critical being embryo quality. A scoring system specific for day 3 embryos is a clinical useful tool reflecting embryo developmental potential, which enable the selection of the optimal number of embryos to transfer in order to achieve the maximum pregnancy rate with the lowest possible incidence of high order multiple pregnancies. A total of 371 transferred embryos from 100 patients were evaluated. The following parameters were used to grade the embryos: cell number, size, shape, cytoplasmic pitting and fragmentation. Three to five embryos were transferred according to patient's age and embryo scoring.

Desai, (2011) studied 93 patients, randomization was made between aged 26-37 years with the mean of 34.1 ± 2.1 . Their BMI ranged between 25-33.7 with the mean value 28.3 ± 2.0 and 24.69-31.6 with the mean value 28.20 ± 1.74 for non-pregnant and pregnant groups respectively, there were no statistical significant differences between them. He found that tubal factor was found in 51.8% and male factor was found in 40.7%. with no statistical significant differences. ⁽⁹³⁾

In the current study, The mean age for all patients was 33.7 years (± 5.2 years). There was no statistical significant difference in age distribution when we compared the pregnant and non- pregnant patients. BMI ranged between 27-34 and 26-33 with the mean of 31.05 ± 2.104 and 30.28 ± 2.052 for non-pregnant and pregnant groups respectively, there were no statistical significant differences between them. Male factor and tubal factor were the main causes of infertility, as male factor was 41% and tubal factor was 31%. With no statistical significant differences.

In this study, the mean duration of infertility in pregnant patients was 3.10 ± 0.98 and in non-pregnant patients was 3.45 ± 0.87 . There was no statistical significant difference between the two groups regarding duration of infertility.

In this study, the mean numbers of embryos transferred according to age were, in patients less than 36 years 3.3 ± 0.65 , in patients between

36 -38 years 3.5 ± 0.97 and in patients between 38-40 years were 4.3 ± 1.45 .

The numbers of cells in the embryos were given the greatest emphasis, as the clinical pregnancy rate was 61.3% in cell number eight or more, while it was 28.9% in cell number below eight.

There was no statistical difference between pregnant and non-pregnant patients when we examined blastomere size or shape.

The relationship between pregnancy outcome and cytoplasmic pitting was 46.5% with the transfer of none or one pitted embryos, and 41.3% with the transfer of two or more pitted embryos. No Statistical difference was observed in clinical pregnancy rates with the transfer of one or more pitted embryos.

As regard Anuclear fragments, the clinical pregnancy rates reached 68% of transferred embryos in absence of fragments while it fell below 42% with anuclear fragments. But differences did not reach the statistical significance.

Roseboom, found that amongst morphological features, fragmentation has been consistently included to aid in defining embryo quality.⁽⁹⁴⁾

Alikani, suggested that the absolute amount of fragmentation may bear less importance than the pattern of fragmentation.⁽⁹⁵⁾

The Cumulative embryo scoring system had a sensitivity of 87.2% and specificity of 100% in classifying transfer cycles into pregnant and non-pregnant, with a cut-off point 3.5 ($P < 0.05$). The mean score of pregnant patients was 4.04 ± 0.78 .

In deriving a CES, the challenge that we faced was taking the many individual observations that we make on an embryo and combining these to yield a single numerical score, that reflect pregnancy potential.

Our findings suggested that blastomere number was the strongest predictor of embryo vitality and pregnancy outcome. As taken

individually, other morphological parameters such as blastomere size, shape, cytoplasmic pitting and fragmentation were not sufficient to predict pregnancy.

Blastomere number was represented the basal score and the other morphological parameters were used to refine the grading further and served to rise or lower this score.

In agreement with our study, Ziebe, suggesting that slower cleaving embryos influence pregnancy rates in a negative manner. In this study, the transfer of four-cell embryos as compared to these at the two-cell stage resulted in two-fold increase in pregnancy rates.⁽⁹⁶⁾

In a laboratory setting, this simplified approach to embryo grading has practical advantages, in that it is quite easily performed and scores are easily interpreted.

One of the problems frequently associated with taking every transferred embryo and calculating a single average score is that in mixed transfers involving embryos of good and bad quality, the overall score can be lowered, and not necessarily reflect the potential for pregnancy.

We found that scoring just the two best embryos was sufficient to predict pregnancy outcome. Since the majority of patients had either three or four embryos transferred, this approach essentially meant that we were making our prediction based on the quality of one-half to two-thirds of the cohort of embryos being transferred. Additional study of embryo score and multiple pregnancy will be necessary to determine if the average CES of all transferred embryos versus that of just the best two embryos offers any advantage in predicting risk of multiple pregnancy and optimal number of embryos for transfer.

Our goal was to use the cumulative embryo score to determine its effect on pregnancy rates. We used a cumulative embryo score similar to the one proposed by Steer et. al. The advantage to this system is that it takes into account the number of embryos transferred as well as the quality of each embryo. It may not be surprising that embryo quality stands out as a great predictor. We also concurred with previous evidence

that embryo quality is correlated with pregnancy outcome. This finding may be clinically useful to consider the cumulative embryo score for each patient before making decisions regarding the number of embryos to be transferred. If the CES is less than 3, consideration may be given to transferring an additional embryo in order to increase the CES, even if it varies from national standard recommendations. Of course, the clinical impact of multiple births should also be considered.⁽⁹⁷⁾

SUMMARY

At least one-quarter of all couples experience unexpected delays in achieving their desired family size. In recent years, there has been advances in reproductive medicine technologies that has helped in reducing both the stigma of infertility and the reluctance of couples to seek advice. The continued progress in the field of Reproductive Medicine has resulted in higher implantation rates, which also has provided a further motive to reduce the number of transferred embryos without affecting pregnancy rates.

ICSI has ability to achieve higher fertilization and pregnancy rates regardless of sperm characteristics makes it the most powerful micromanipulation procedure to treat male factor infertility.

Non-invasive methods of embryo evaluation help assess embryos without damage. Many different embryo scoring methods have been described. The main features considered in embryo scoring systems include blastomere number, blastomere size, shape, equality, appearance of cytoplasm and degree of fragmentation. These factors have been combined in complex numerous ways, to produce embryo scoring systems aiming at identifying embryos that would potentially result in a pregnancy. Embryos on day 3 should have around eight blastomeres that are equal in size and show no multinucleation, the cytoplasm of each blastomere should be pale and clear with some granulation, and fragmentation should be < 20%.

Cumulative Embryo Score (CES) is a clinically useful tool reflecting embryo developmental potential, which will enable the selection of the optimal number of embryos to transfer in order to achieve the maximum pregnancy rate with the lowest possible incidence of high order multiple pregnancies. Such scoring system would have the definite practical advantages of being easily performed and interpreted with little room for inter-observer variation.

The aim of this work was to study a cumulative embryo score system (CES) for the prediction of pregnancy outcome among cases undergoing intracytoplasmic sperm injection (ICSI). Primary outcome was the occurrence of pregnancy; as detected by ultrasonography or a positive serum β -HCG.

The results of this study showed that:

blastomere number was the strongest predictor of embryo vitality and pregnancy outcome. As taken individually, other morphological parameters such as blastomere size, shape, cytoplasmic pitting and fragmentation were not sufficient to predict pregnancy.

The mean score of pregnant patients was 4, the minimum score was 3, while the maximum score was 5.

The scoring system showed sensitivity of 87% and specificity of 100% in classifying transfer cycles into pregnant and non-pregnant with a cut-off point at 3.5

In conclusion, cumulative embryo scoring can easily performed, good prognostic tool and effective for reduction of high order multiple pregnancies.

CONCLUSION

In our study we found that:

1. Embryo scoring can easily be performed
2. Embryo scoring is prognostic of pregnancy outcomes among cases undergoing intracytoplasmic sperm injection (ICSI).
3. It is appropriate to use embryos scoring system instead of single factor aiming at identifying embryos that would potentially result in a pregnancy
4. Such scoring system, would have the definite practical advantages of being easily performed and interpreted with little room for inter-observer variation