A Case Control Study of Antioxidant Therapy in Patients With Multiple Failed IVF Cycles

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Abstract

Aim:
Egg quality and therefore embryo quality is a limiting factor in IVF. Mitochondria supply ATP to the cell, and higher levels are associated with better quality eggs. Excessive reactive oxygen species (ROS) are implicated in mitochondrial damage. Melatonin is a powerful free radical scavenger and antioxidant. Our study examined the use of melatonin in IVF patients with multiple unsuccessful cycles.

Method:
Retrospective analysis of the use of melatonin in 13 patients who had previously undergone at least two unsuccessful IVF cycles. Two controls per case were matched for age, cycle number, stimulation type and dose; considering BMI, infertility aetiology and andrology. Primary outcomes were oocyte number, maturity and utilization rates. Secondary outcomes included clinical and biochemical pregnancies, peak oestrodial levels and follicles >11mm. T-tests were used for continuous data and Fisher’s exact test for categorical data; p<0.05 considered significant.

Results:
When melatonin cases were compared to the matched controls, no statistically significant differences occurred in any primary or secondary outcomes assessed. Interestingly, when melatonin cases were compared to their previous cycle, oocyte number trended towards increased value (5.1 vs 7.1, p=0.1744). Of clinical relevance, increase in mature oocyte numbers compared to previous cycles approached statistical significance (3.4 vs 4.9, p=0.0515). Duration of FSH, max E2, follicle number and numbers of embryos transferred or frozen showed no significant changes.

Conclusion:
In patients with multiple unsuccessful IVF cycles, melatonin may improve oocyte quantity and increase development to mature oocytes. The trends in the small group of patients warrants further study.