The Impact of Laser-assisted Hatching on clinical outcome of intracytoplasmic sperm injection (ICSI)

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Objectives: To evaluate the role of laser-assisted hatching (LAH) in improving the clinical outcome of ICSI in patients aged >= 37 years and patients using frozen-thawed embryos.

Design: A prospective randomized study.

Setting: Reproductive medicine unit in Saarland University.

Materials and Methods: A total of 380 patients were enrolled in this study, 200 patients with advanced female age >=37 years (G.I) and 180 patients using frozen-thawed embryos (G.II).

Patients in (G.I) were subdivided equally into two subgroups (a control subgroup GI. A= 100, and a test group G.IB= 100 patients).

In the second Group (G.II, n= 180) are the patients who become embryo transfer after freeze thawing procedure.

Similarly, they were also subdivided into two groups. G.II A include 90 patients who become embryo transfer without assisted hatching (control group) and 90 patients G.II B (test group) who become embryo transfer after assisted hatching, on the day of embryos transfer.

Intervention(s): The zona pellucida of the embryos of the test groups in the G.IB and G.II B were opened about 40 mm by using an infrared optical laser system, whereas, in the control group all embryos were transferred without assisted hatching. Main Outcome Measure(s) were implantation and clinical pregnancy rates.

Results: The implantation and clinical pregnancy rates in the patients with advanced female age after assisted hatching were (10.2% and 33.0% respectively) and the corresponding value for patient without assisted hatching were (8.6% and 27.0%; p= 0.5, control group). However, in patients using frozen-thawed embryos, the implantation rates (5.5%) and clinical pregnancy rates (14.4%) were significantly lower (p=0.01) in the patients without assisted hatching in comparison to patients becoming their embryos after performing assisted hatching (11.3 % and 30.0% respectively).

Conclusion(s): Laser-assisted hatching technique showed no advantage in improving the implantation and pregnancy rates in patients aged >= 37 years. However, a significant improvement has been demonstrated in the patients undergoing embryo transfer after freeze-thawing procedure. Therefore, it is advisable to perform assisted hatching technique only on frozen thawed embryos before transfer. Also, the laser-assisted hatching has improved both the implantation and pregnancy rates in patients using

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frozen-thawed embryos but not effective in patients with advanced female age.