

EFFECTS OF MODIFIED LASER-ASSISTED INTRACYTOPLASMIC SPERM INJECTION (LA-ICSI) IN HUMAN OOCYTES

KH Choi¹, YH Yang¹, JH Lee¹, JS Seo¹, YJ Jang¹, DR Lee¹, JW Kim¹, SU Lyu¹, JE Han¹, HA Seok¹, SH Song¹, WS Lee¹
Fertility Center, CHA Gangnam Medical Center, CHA University, 606-5 Yeoksam-dong, Gangnam-gu (Republic of Korea)

Purpose: Since the first pregnancies has been reported in 1992, ICSI was applied and adapted in human assisted reproduction technology (ART) and became the treatment of choice for male factor infertility and repeated IVF failure. Although high successful clinical outcome can be obtained ICSI might induce a minimal amount of mechanical and physiological damage of human oocytes, and it may cause a little of harmful effect to the microinjected oocytes. Therefore, LA-ICSI, micro-opening of the zona pellucida (ZP) prior to ICSI, could be used as an alternative method to lower the degeneration rates of human oocytes and enhance the embryo development rates. And so, the objective of this study was to evaluate the benefits of our modified LA-ICSI, thinning of the ZP prior to ICSI, among unselected patients undergoing in vitro fertilization with conventional ICSI (C-ICSI).

Materials and methods: From February to May in 2009, two prospective studies involved each 24 cycles with 348 MII oocytes and 80 cycles of old age patients with 332 MII oocytes. In first study, group I included modified LA-ICSI and group II included C-ICSI among 24 cycles. Group I was used for the zona thinning (ZT) procedure applied to one positions on the zona pellucida (ZP) of each embryo to thin 70% of the ZP. Group II - patients with no ZP. The second study was conducted for patients aged 37 and over with modified LA-ICSI or C-ICSI. Fertilization rate, oocytes degeneration, good quality embryo rate and pregnancy rate were identified. Statistical significance was tested using the chi-square test.

Results: The rates of fertilization and oocytes degeneration from Group I (fertilization: 76.2%, oocytes degeneration: 0.6%) and Group II (fertilization: 85%, oocytes degeneration: 2.8%) were similar. When modified LA-ICSI compared with C-ICSI, good quality embryo rate (on day 3) were 63.3 and 47.1% ($P<0.05$) respectively. The rates of clinical pregnancy were differ for Group I embryo transfer (7/10, 70%), for Group II embryo transfer (5/9, 55.6%) and for combined Group I and Group II embryo transfer (1/5, 20%). All modified LA-ICSI was significantly higher in the patients aged 37 and over, there were differences in fertilization (85.5% versus 74.9%), good quality embryo rate (67.8 versus 32.9%).

Conclusion: Therefore, it suggested that modified LA-ICSI may be applied in selected cases associated with old aged, or where patients have very few oocytes available, to improve the chances for pregnancy.

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