Impact of individual follicular G-CSF quantification as a new tool to improve the embryo selection

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Introduction: Granulocyte colony-stimulating factor concentration quantified in individual follicular fluids ([FF G-CSF]) appeared previously to be correlated with the potentiality of birth of corresponding fertilised oocytes after embryos transfer. We thus evaluated the impact of an individual assessment of FF G-CSF as a new tool to improve the embryo selection. Materials and Methods: FF G-CSF were retrospectively quantified in 523 individual FF corresponding to 114 fresh transferred embryos, 278 frozen embryos and 131 destroyed embryos among 78 patients undergoing ICSI. The quantification was performed using the luminex XMap Technology. Results: Using the ROC curve methodology, FF G-CSF was significantly predictive of subsequent ongoing pregnancy (AUroc: 0.77 ([0.69-0.83]-p<0.001). Embryos generated were classified according to their [FF G-CSF]: Group I: over 30 pg/ml (highest positive predictive value ), group II: from 30 to 18.4 pg/ml and group III: less than 18.4 pg/ml (highest negative predictive value). Embryos from follicles group I had an implantation rate (IR) of 36%, significantly higher than the ones group II (16.6%) and III (6%) (p< 0.001). Embryos from follicles group I with a Top morphology reached an IR of 54% (p< 0.001). Frozen-thawed embryos transferred from group I had a significantly higher IR than group II and III (37% versus 7 and 5%, p<0.001). Only 35% of frozen embryos but also 10% of destructed embryos were from group I for G-CSF. 24% (19/78) of the patients appeared not having been transferred with the optimal embryos available the day of transfer. If compared with patients which received at least one optimal embryo, subsequent implantation rate was significantly decreased (From 32 % to 10%, p=0.04). Conclusion: FF G-CSF monitoring, through a better selection of embryos may improve both efficiency and time required to obtain a pregnancy.