“FOLLICULAR FLUID INSULIN LIKE GROWTH FACTOR-1 (FF IGF-1) IS A BIOCHEMICAL MARKER OF EMBRYONIC HEALTH AND IMPLANTATION RATES IN IVF CYCLES”

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Health of embryo may be a major determinant of its implantation potential in IVF cycles. IGF-1 has been reported to play a role in human follicular and embryonic development. However, earlier studies carried out mostly in animal models or in culture mediums supplemented with IGF-1 have been unable to directly link IGF-1 with embryo quality. Results correlating IGF-1 with pregnancy outcome have also been ambiguous so far. Therefore, objective of this study was to find if in-situ follicular-fluid level of IGF-1 may be a marker of embryonic health and implantation rates in IVF cycles.

This prospective study carried out between March 2010 and December 2011 involved 120 cycles of conventional in-vitro fertilization-embryo transfer in infertile women. To maintain homogeneity in study population, subjects with PCOS, endometriosis and ICSI cycles were excluded from the study. IGF-1 concentrations were estimated in pooled follicular-fluid on day of oocyte pickup. Embryo quality was assessed at cleavage and blastocyst stages. Embryo quality, clinical pregnancy and implantation rate were the main outcome measures. Statistical analysis was done by Graph pad prism package (version 5). This is the first ever study that correlates FF IGF-1 with embryonic health (Pearson r=0.3894, r²=0.1516, p<0.0001). High FF IGF-1 group shows significantly higher rates of fertilization (82.80 ± 17.65 vs. 78.49 ± 19.49%, p= 0.0320) blastocyst formation (44.71 ± 15.13 vs. 18.82 ± 2.75%, p<0.0001) and top grade embryos (61.19 ± 23.08 vs. 25.19 ± 10.29%, p<0.0001) compared to low FF IGF-1 group. Clinical pregnancy rates (38.33 vs. 20%, p= 0.0272) and embryo implantation rates (21.6 vs. 10.32%, p= 0.0152) are also significantly higher in the high vs. low FF IGF-1 group. FF IGF-1 correlates strongly with clinical pregnancy (Pearson r=0.5972, r²= 0.36, p<0.0001). Threshold value of FF IGF-1 for clinical pregnancy is >58.50 ng/mg protein (ROCAUC: 0.85±0.03, 95%CI: 0.78 to 0.91).

FF IGF-1 is a plausible biochemical marker of embryonic health and implantation rate and correlates with clinical pregnancy rates in conventional IVF cycles.