Effect of Activin A, Fibrillin-3, and Follistatin on oocytes quality and embryonic development following ICSI cycle

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**Key words:** Activin A, Follistatin, Fibrillin-3, ICSI, metaphase II oocytes.

**Summary**

**Study question:** The aim of this study is to elucidate the effect of Activin A, Follistatin and Fibrillin-3 hormones on the oocytes number and quality, embryonic development, and pregnancy rate (PR) following intra cytoplasmic sperm injection (ICSI) cycle.

**Summary answer:** There was a positive correlation between follistatin hormone level in the follicular fluid and MII oocytes maturation to predict intra-cytoplasmic sperm injection outcome.

**Study design, size, duration:** A prospective study which involves two hundred infertile females selected from the Consultant Clinic in Kamal Al-Samaria IVF Center in Baghdad-Iraq and Janpalfijn IVF Center in Ghent -Belgium through the period from August 2014 to July 2015.

**Subject, Materials and Methods:** Controlled ovarian stimulation was done with two different protocols. Measurements of Activin A (pg/ml), Follistatin (ng/ml) and Fibrillin-3 (ng/ml) were assessed in serum and follicular fluid on the day of ovum pick up. Intra cytoplasmic sperm injection was performed and the oocyte and embryonic development were evaluated and determined in relation to the levels of these hormones.

**Main Results:** There was a significant difference between number of Metaphase II oocytes and high quality embryos (G1) in pregnant women than that of non-pregnant women. The follistatin follicular fluid (FF) is the only hormone level which has a significant relation with total oocytes and good Metaphase II oocytes. Both the mid-cycle level in serum and follicular fluid of activin-A show a negative correlation of around -0.2 with the total number of embryos and the number of G1 embryos. For both Activin A and Fibrillin-3, there were a high or relatively high correlation within the pregnant subject and low till very low correlation in the non-pregnant subjects, independent of the stimulation protocol.

**Limitations, reasons for caution:** the results found no limitations or any reason for caution.
Wider implications of the findings: The Follistatin FF has a significant correlation with good MII oocytes that could be used as a predictor for successful ICSI outcome.

Trial registration number (if registered clinical trial): NON