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PREDICTIVE VALUES OF DHEAS, TT AND IGF1 IN SUCCESSFUL PREGNANCY OUTCOME OF PATIENTS UNDERGOING IVF/ICSI-ET

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ABSTRACT : Clinical index is needed to predict the successful pregnancy after *in vitro* fertilization/ intracytoplasmic sperm injection-embryo transfer (IVF/ICSI-ET) for infertile patients. Insulin like growth factor 1 (IGF1), Dehydroepiandrosterone sulfate (DHEAS) and Total Testosterone (TT) may have a role on follicle growth, oocyte quality, embryo quality and subsequent pregnancy in patients undergoing IVF cycles. To explore the possibility of using DHEAS, TT and IGF1 as predictive indicator for successful pregnancy in patients undergoing (IVF/ICSI-ET). A prospective study was performed enrolling (12) non pregnant control group, (7) pregnant control group, (18) non-pregnant PCOS group and (12) pregnant PCOS group. The collection of blood and follicular fluid (FF) samples was done at the day of oocyte aspiration. Electrochemiluminescence immunoassay (ECLIA) method was used to measure DHEAS levels, Chemiluminescence immunoassay (CLIA) method was used to measure TT levels and competitive enzyme-linked immunosorbent assay (ELISA) was used to measure IGF1 levels. Mean of FF DHEAS, serum DHEAS, FF TT and FF IGF1 were higher in pregnant control group than those of non-pregnant control group. The differences were statistically significant (except for serum DHEAS). Additionally, mean of FF DHEAS, serum DHEAS, FF TT, and FF IGF1 were statistically significant lower in pregnant PCOS group than those of non-pregnant PCOS group. Correlation analysis of control group revealed positive association between FF DHEAS and serum DHEAS levels with fertilization rate and cleavage rate. Correlation analysis of PCOS group found negative association between FF TT and M II oocyte, positive association between FF IGF1 and serum DHEAS and positive association between serum DHEAS and FF TT. In control group and PCOS group, ROC analysis indicated that FF DHEAS is a good marker for predicting pregnancy, followed by FF TT. Intrafollicle DHEAS and TT has a predictive use for the successful pregnancy in both of control and PCOS women.

Key words : Dehydroepiandrosterone sulfate, *in vitro* fertilization, oocyte, follicular fluid, intra-cytoplasmic sperm injection.

INTRODUCTION

Assisted reproductive techniques (ART) seek to achieve largest possible number of oocytes of good quality (Macklon *et al*, 2006). *In vitro* fertilization (IVF) and intracytoplasmic sperm injection (ICSI) are widely used techniques to solve human infertility. These techniques provided great benefits for couples, who have struggled with infertility disorders (Lu *et al*, 2013).

Follicular fluid (FF) is biological microenvironment that promotes the growth of the oocyte and the following embryo. FF is the product of theca cells and granulosa cells secretion that encircle the follicular wall. The content of FF includes different substances such as hormones, cytokines, growth factors, and antioxidants. These mediators may a have a direct effect on oocytes quality and maturation ability (Revelli *et al*, 2009).

The insulin like growth factor (IGFs) family have important role in initiation of follicle growth (Franks *et al*, 2008) and affecting mammalian embryo development (Miese-Looy *et al*, 2011).

In the ovaries, growth hormone binds to growth hormone receptors found on granulosa, luteal, theca cells. This supports the process of steroidogenesis and gametogenesis. The production of growth hormone induces the liver to synthesize IGF1. The IGF1 and growth hormone releasing hormone increase ovarian sensitivity to gonadotropin stimulation, which in turn affects the follicle marturation and the gamete (Kingsberg Medical, 2018).

The stimulatory effect of gonadotropins depends on the expression of IGF1 receptor in granulosa cells of human, rat and mouse (Zhou *et al*, 2013).

Theca cells control granulosa cells proliferation by enhancing IGF1 expression (Shiomi-Sugaya *et al*, 2015). Moreover, locally produced IGF1 may affects the mechanisms of folliculogenesis, inducing a larger number