

## The correlation between sperm DNA integrity and IVF success rate in infertile couples

Dehghani Ashkezari M. (Ph.D.)<sup>1</sup>, Kalantar S.M. (Ph.D.)<sup>2</sup>, Parivar K. (Ph.D.)<sup>3</sup>, Aflatounian A. (Ph.D.)<sup>4</sup>.

1- Assistant Professor, Department of Cellular and Molecular Biology, Molecular Research Center, Azad University, Ashkezar, Yazd, Iran.

2- Associate Professor, Department of Reproduction & Genetics, Research & Clinical Center For Infertility, Yazd University of Medical Sciences & Health Services, Yazd, Iran.

3- Professor, Department of Biology, Faculty of Science, Science & Research Unit, Tehran Azad University, Tehran, Iran.

4- Associate Professor, Department of Gynecology, Faculty of Medicine, Shahid Sadoughi University of Medical Sciences & Health Services, Yazd, Iran.

### Abstract

**Introduction:** Assisted reproductive technologies have been used for the treatment of a considerable number of infertile couples. Conduction of several cycles of treatment, spending a lot of time, money and energy and the probable complications accompanying repeated anesthesia have made researchers find ways to predict the outcome of different methods used for the treatment of infertility. Male factor infertility is accountable for fifty percent of infertilities. Although semen analysis is an initial test to evaluate male fertility potentials but the results do not always predict fertilization outcomes. Sperm function tests have been suggested to predict the fertilization rate in ART treatment cycles. The objective of this study was to evaluate the diagnostic capabilities of double-stranded DNA in fertilization rate predictions.

**Materials & Methods:** 100 infertile men were randomly selected. Based on WHO's 1999 criteria, semen analysis for each case was performed. DNA evaluation was performed by using Acridine orange. According to the fertilization rates (FR), the cases were divided into 3 groups: group I with FR>50%, group II with FR<50% and group III with a total fertilization failure (TFF). The results were analyzed by using ANOVA, correlation coefficient, and calculation of the area under receiver operating characteristic (ROC) plot. The level of significance was considered 5%. For the prediction of DNA normality likelihood and the best cut-off points for the variables, calculation of the area under the ROC plot was employed.

**Results:** There were no significant differences between fertilization rates (FR) and sperm parameters in IVF treatment cycles. Only a weak correlation was observed between tail defects and FR. Regression analysis showed a correlation between double-stranded DNA & fertilization rates ( $p=0.04$ ). The analysis of variance for the mean of double-stranded DNA in cases with FR>50%, FR<50% and TFF showed a significant difference at the level of  $p<0.05$ . ROC analysis showed that at 50% fertilization rate, the cut-off point for DNA normality was 47.25%.

**Conclusion:** Although semen analysis is an initial test for male fertility but it is not adequate for the prediction of IVF results. The use of DNA normality function tests in conjunction with semen analysis may be helpful in choosing treatment protocols and predicting fertility success rates at 50%, < 50% and T.F.F. levels.

**Key Words:** DNA normality, Double-stranded DNA, Acridine Orange, IVF.

**Corresponding Author:** Dr. Kalantar, Seyed Mehdi, Department of Reproduction & Genetics, Research & Clinical Centre for Infertility, Yazd University of Medical Sciences & Health Services, Yazd, Iran.

**E-mail:** smkalantar@yahoo.com