THESIS ABSTRACT

Human male infertility is commonly due to the deficiencies present in human semen. The quality of the semen was directly influencing the fertility. Our objective is to increase the semen quality and easy diagnosis of male infertility at biochemical level. For this, we worked with 662 human semen samples. The major semen parameters considered were whole semen protein content, seminal fructose concentration, glucosidase activity, microelements concentration and antioxidants activity. In order to know the cut off range for various biochemical assays for different categories of male infertile semen samples were used and compared. All the semen samples were initially subjected to semen analysis as per standard protocol of World Health Organization, 2010 protocols.

Primary focus of the study started with preserving the samples with suitable extenders. This study was done with four different extenders. The best suited extender to preserve the infertile and fertile semen samples was identified as the extender which was supplemented with various antioxidants. Later, the different category samples were analysed for the concentration of the protein in various fractions of samples and compared with control. SDS-PAGE was done for all the category of samples with respective seminal plasma. Seminogelin II was identified as the fertility associated protein and it was found to be missing in case of asthenospermia and oligoasthenospermia (motility issues). Seminal fructose, glucosidase and microelements in seminal plasma of various categories were evaluated and compared with control samples. Antioxidants like SOD, Catalase and glutathione in seminal plasma was done for all the samples. The result was found to increasing with increase in sperm count in millions/ml.

For the proper diagnosis of male infertility, many biochemical parameters have to be evaluated. Each and every assay was found to be economically costly and time taking process. In order to reduce the time and economy of the patients, we developed three different neural network algorithms to predict four different biochemical parameters. This result concludes that Back Propagation neural network model predicts the biochemical parameters with less error than other algorithms.

Key Words: Male infertility; human semen; antioxidants; seminal plasma; neural network