COMPARISON OF SPERM VELOCİTY AND MOTILITY OF NORMAL AND OLIGOSPERMIC PATIENTS

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ABSTRACT

Introduction: Inadequate sperm production is one of the leading causes of male infertility. Infertility can be defined as the fact that married couples do not have a pregnancy despite one year of unprotected intercourse. The most important test to be applied to detect male infertility is spermiogram analysis. According to the results of the spermiogram, no semen in the semen fluid, azoospermia, inadequate number of sperm is called oligospermia. Sperm mobility and speed are very important for fertilization. Sperm production and maturation, transportation and storage problems negatively affect sperm motility, velocity and concentration. **Objective:** In this study, it will be determined whether the motility and velocity, which is one of the important sperm characteristics, varies between normal and oligospermic patients. The results of the study will contribute to planning of treatment, improvement of semen parameters of oligospermic patient and determination of quality of semen sample for these parameters before insemination and IVF. **Materials and methods:** In this study, routine spermiogram analysis data will be used. **Discussion and conclusion:** According to the results of the study, there was a significant difference between the sperm motility and velocity of normal and oligospermic patients according to Mann-Whitney U test results ($p = 0.000$). In patients with oligospermic sperm velocity and motility is lower than normal ones. There was also a strong positive correlation between sperm concentration and sperm velocity in both oligospermic and normal patients.

Keywords: Spermiogram, Oligospermia, Sperm velocity, Sperm motility.

NORMAL VE OLİGOSPERMİK HASTALARIN SPERM HIZI VE HAREKETLİLİĞİNİN KARŞILAŞTIRILMASI

ÖZET

Giriş: Sperm üretim yetersizliği, erkek infertilitesinin başta gelen nedenlerindendir. İnfertilite evli çiftlerin bir yıllık korunmasız ilişkiye rağmen gebeliğin oluşmaması olarak tanımlanabilir. Erkek infertilitesinin tespitinde ilk uygulanacak en önemli test spermiyogram analizidir. Spermiyogram sonucuna göre semen sıvısı içinde hiç sperm bulunmamasına azoospermi, yetersiz sayıda sperm bulunmasına ise oligospermi denilmektedir. Sperm hareketliği ve hızı döllenmenin gerçekleşmesinde büyük önem taşımaktadır. Sperm üretimi ve

olgunlaşması, taşınması ve saklanmasındaki aksaklıklar sperm hareket, hız ve konsantrasyonu üzerine olumsuz etki etmektedir. **Amaç** Bu çalışmada gebeliğin oluşmasında önemli sperm niteliklerinden olan hareketlilik ve hızın, normal ve oligospermik hastalar arasında değişiklik gösterip göstermediği belirlenecektir. Çalışma sonucuna göre tedavinin planlanmasına, oligospermik hastanın semen parametrelerinin iyileştirilmesine ve semen örneğinin bu parametreler bakımından aşılama ve IVF öncesinde kalitesinin belirlenmesine katkı sağlanacaktır. **Araçlar ve yöntem:** Araştırmada rutin spermiyogram analizi verilerinden yararlanılmıştır. **Tartışma ve sonuç** Çalışma sonucuna göre normal ve oligospermik hastaların sperm hareketliliği ve hızı arasında Mann-Whitney U testi sonuçlarına göre anlamlı bir farklılık görülmüştür ($p = 0,000$). Oligospermik hastalarda sperm hızı ve hareketliliği normal olanlara göre daha düşük seviyededir. Ayrıca hem oligospermik hemde normal hastalarda sperm konsantrasyonu ile sperm hızı arasında kuvvetli pozitif korelasyon tespit edilmiştir.

Anahtar Kelimeler: Spermiyogram, Oligospermi, Sperm hızı, Sperm hareketliliği.

INTRODUCTION

The causes of male infertility include varicoceles, ductal obstructions, ejaculatory disorders. According to the origin of infertility; pretesticular, testicular and posttesticular. The problem is in hormonal connections between hypothalamus, pituitary gonad and gonads. Genetic, anatomical and subsequent infections or traumas can be found at the root of these problems in the hormonal control of the male reproductive system. Although hormonal control is normal in testicular factors, spermatogenesis is impaired, and the cause of posttesticular disorders is a blockage or ejaculatory dysfunction that occurs in the part from the rete testes to the ejaculatory duct (1). The hypothalamus and pituitary gland in the testis by adapting to the leydig cells and testosterone production provides the realization of spermatogenesis. A deterioration in this hormonal axis may cause infertility. It is thought that approximately 2300 different genes should work together in order to result in successful production of sperm. In contrast, male infertility is associated with the polymorphism of only a few genes in routine practice. Unfortunately, a sufficient number of animal experiments have not been made to create a model for male infertility. In practice, Y chromosome microdeletions, chromosomal translocations, karyotype analyzes, cystic fibrosis transmembrane conductance regulator protein mutations and sperm genetic tests are available which cause congenital vas deferens agenesis. These tests can explain only 20% of the genetic factors that cause male infertility. The remaining 80% is classified as idiopathic (2). A normal semen of about 20 million sperms/ml. The number of abnormal sperm should be less than 40%. An estimated 40 to 90% of male infertility is due to defective sperm production of indefinable origin (Sinclair, 2000). Sperm Motility is one of the most important characteristics of spermatozoa. Therefore, the examination of motility constitutes an integral part of semen analysis (3).

MATERIAL AND METHOD

The spermiogram results of infertility patients who applied to our clinic in 2018 were evaluated by the approval of the ethics committee of Van Regional Training and Research Hospital dated 12/04/2018 and numbered 2018/07. The spermiogram test was performed by evaluating the parameters in accordance with the WHO criteria. The examination of the semen sample delivered to the Andrology laboratory was started 10-30 minutes later. The sample was considered to be viscous in excess of 30 minutes. Microscopic examination of the semen specimen was performed with a counting chamber in the X20 objective. Samples

which were suitable for Kruger examination were spread after the lama was spread and passed through sequential paints. Prepared semen preparations were examined in such a way that at least 200 cells were counted by dropping the oil in X100 objective. Kruger normal value was accept as 3-4%.

FINDINGS

"Kolmogorov-Smirnov" and "Shapiro-Wilk" tests were performed to determine whether the data were normal. Both tests are "Sig." "For all groups, the data is not normally distributed with 95% confidence because the values are less than 0.05". concluded. Therefore, "Mann-Whitney U test was used to compare the groups. For total motility, oligospermia (N = 223) mean rank 594, sum of ranks 132505, for the normal group (N = 1345) mean rank 816, sum of ranks 1097591 was found. For velocity: oligospermia (N = 219) mean rank 219, sum of ranks 48096, for normal group (N = 1340) mean rank 871, sum of ranks 1167923 was found. According to the Mann-Whitney U test results, the test statistic was found as Total motility: 107529, velocity: 2.401E4. Z value for total motility: -6,779, for velocity: -19,937. Asymp. p. (2-tailed) was found to be 0 (p = 0,000).

Descriptive Statistics of oligospermic patients of spermiogram; Sperm concentration (M/ml): (N = 223) 2,10 (min), 15,00 (max), 9,3529 (mean), 2,91121(Std.Dev.), Total Motility (PR+NP) (%): (N = 223) 0,00 (min), 90,00 (max), 44,3498 (mean), 18,30678 (Std.Dev.), Velocity (mic/sec): (N = 218) 1,00 (min), 13,00 (max), 5,3716 (mean), 2,89040 (Std.Dev.)

Descriptive Statistics of normal patients of spermiogram; Sperm concentration (M/ml): (N = 1345) 16,10 (min), 293,90 (max), 59,5278 (mean), 38,62156 (Std.Dev.), Total Motility (PR+NP) (%): (N = 1345) 0,00 (min), 97,00 (max), 53,5375 (mean), 17,56579 (Std.Dev.), Velocity (mic/sec): (N = 1340) 1,00 (min), 21,00 (max), 11,6440 (mean), 3,34646 (Std.Dev.)

According to Pearson correlation analysis: in oligospermia patients, 0,141 (weak positive correlation) between sperm concentration and total motilty, (p = 0,035), sperm concentration and velocity of 0.458 (strong positive correlation) between velocity, (p = 0,000) were determined.

In the normal patient group, sperm concentration was found to be -0,173 (weak negative correlation), (p = 0,000) between sperm concentration and 0,490 (strong positive correlation) between sperm concentration and velocity (p = 0,000).

RESULT AND DISCUSSION

A major influence of sperm motility upon the fertilizing potential of human spermatozoa has been demonstrated (Aitken et al., 1983), Huszar et al. The effect of hyaluronic acid on sperm motility, Donnelly et al. (4-6). They investigated the effect of antioxidants on sperm velocity, Leclerc et al. 'cyclic adenosine 3'-5' monophosphate' investigated the effect on sperm motility. As stated in these studies by these researchers; sperm velocity and motility are very important in the fertilization of ovum (Van Kooij, 1986) (7-8). İnal et al, Kececioglu, Demirel et al. Göşkun et al., Osser et al and Hammoud et al. have studies on statistical analysis of spermiogram parameters (9-14). However, in current studies, there is no study to compare the spermiogram parameters of oligospermia and normal patients. In this study oligospermic patients were compared with the normal ones. According to the comparison, sperm motility and velocity in oligospermic patients are lower than in normal patients. The spermiogram parameters of normal and oligospermic patients are different from the results of the Mann-Whitney U test. In the normal patient group, it was observed that the motility

decreased as the sperm concentration increased. This is commonplace. Because sperm cell density can be restrictive of movement. The reason for this is not observed in oligospermic patients; This is because the sperm cell density in oligospermic patients is already low. Velocity of healthy sperm should also be sufficient. It is very interesting to find a positive correlation between sperm velocity and its concentration. It can be concluded that people with normal sperm concentration produce more healthy sperm. According to our findings, treatment approaches to increase sperm quality of oligospermic patients will contribute to prevention of infertility.

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