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Relationship Between The Number of Sperm Quality and Testosterone Hormone Levels in Tiara Sella Hospital Bengkulu

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***Abstract*— Indonesia has 12% or about 3 million infertile couples. Only half of that amount can be helped according to desire. 30% of these infertile partners are male as a cause in infertile couples. And there is a tendency for a meaningful increase. Almost every couple in the world wants a child, but unfortunately not every marriage is awarded a descent. There are 10-15% of couples experiencing infertility, the condition begins when a woman is unable to not become pregnant or pregnancy until childbirth, even though she has had regular sexual intercourse without using contraceptives for a year or more, the condition is usually called fertility or in the medical language referred to as infertile. This study aims to determine the relationship between testosterone hormone levels and sperm counts in male infertile couples at Tiara Sella Bengkulu Hospital. This study was carried out at Tiara Sella Hospital by examining testosterone levels and sperm counts and then tested the correlation between the two. The results showed that there was no correlation between testosterone levels and sperm count (p> 0.05). It is hoped that more careful research will be carried out, especially on the results of azoospermia sperm..**

Keywords--- Testosterone hormone; Sperm

I. INTRODUCTION

Indonesia has 12% or about 3 million infertile couples. Only half of that amount can be helped according to desire. 30% of the infertile partners are male as a cause in infertile couples, and there is a tendency to have a significant increase.[1,2,3,8]

Almost every couple in the world wants a child, but unfortunately not every marriage is awarded a descent. There are 10-15% of couples experiencing infertility, the condition begins when a woman is unable to not become pregnant or pregnancy until childbirth, even though she has had regular sexual intercourse without using contraceptives for a year or more, the condition is usually called fertility or in the medical language referred to as infertile.[1,12]

Infertility is a problem experienced by men and women everywhere in the world. Although the estimated incidence is not very precise and varies from region to region, about 8% of couples experience infertility problems during their reproductive period, if extrapolated to this global population means that between 50 to 80 million people have fertility problems, a condition that causes suffering personal and family life disorders. It is estimated that there are around 2 million new infertile couples every year and this number continues to increase. This, when compared with new cases such as cancer cases, is estimated at 5.9 million new cases per year and 100 million new cases of malaria are still far away, but even so enough to cause significant problems in national health resources.

Changes in demographic patterns in the last 50 years in developed countries, and especially in the last 20 years in some developing countries, the incidence of infertility in developed countries is reported to be around 5-8% and in developing countries around 30 %.WHO estimates around 8-10% or around 50-80 million couples around the world experience infertility problems, thus making infertility an urgent problem, vigilance will increase rapidly, the number of infertile couples in Indonesia can be calculated from the number of women who have ever married and have no surviving children, according to the population census there are 12% both in the village and in the city, or about 3 million infertile couples throughout Indonesia.

In accordance with the new paradigm of the National Population / Family Planning Program in Indonesia, its vision has been changed from realizing the Happy and Prosperous Small Family Norms (NKKBS) to become its vision to realize "Quality Family in 2015". A quality family is a family that is prosperous, healthy, advanced, independent, has the ideal number of children, is forward-looking, responsible, harmonious, and fearful of God Almighty.

So for couples who have not been blessed with children should also be given infertility services so that they can also realize the goals of the vision for themselves / their families. And actually, family planning is never complete without countermeasures. Handling infertile or infertile couples is a complex medical problem and involves several medical disciplines, so it requires complex consultations and

ons. Today's medical science has only managed to help 30% of infertile couples get the child they want. That means the other half are forced to live without children, raising children (adoption), polygamy or divorce. Thanks to advances in medical technology, several infertile couples have been able to get children by insemination made by donors "IVF" or raising the fetus in the womb of other women but this requires a high cost.

Infertility can be caused by various factors, both from the husband's factors and from the wife's factors, infertility due to wife's factors, including 45% who have problems with the vagina, cervix, uterus, abnormalities in the tubes, ovaries, and peritoneum. While infertility due to husband's factor is around 40%, including sperm disordered, seminal duct narrowing due to congenital infections, immunologic / antibody, antispam, and nutritional factors. The combined factor caused by both husband and wife is around 20-30%. While due to unexplained factors around 10-15%.[2,3,4, 11,12]

The causes of infertility vary greatly. In infertile men often found poor sperm quality, sometimes the production of spermatozoa in the testes is small and the testes are too small and other causes that cause sperm quality is reduced due to epididymitis, prostatitis, varicocele or endocrine abnormalities. According to andrologists, the fact that the cause of infertility is not separated from the production of spermatozoa and hormone disorders such as the hormone testosterone. Other causes of infertility are age factors, factors of sex, environment, nutrition, social changes and unhealthy lifestyles, such as poor quality sleep, stress and depression, smoking and consuming alcohol.[2,4,6,10]

Spermatogenesis depends on the adequacy of a number of hormones FSH (*Follicle Stimulating Hormones*) and LH (*Luteinizing Hormones*) and testosterone. The hormone functions to control cellular function in the reproductive system which includes: the flow of ions, enzyme activity, synthesisprotein, synthesis and secretion of testosterone, proliferation, and termination of germ cells, spermatozoa maturation, and inter-cell communication. Barriers to the biosynthesis of reproductive hormones can cause infertility in men. Specifically, testosterone differences in work effectiveness in germ cells and the target is expected to depend on both the level and molecular structure and ability of sperm production.[3,5,6,9}

II. METHODS

Type of research is a descriptive study with a cross-sectional approach. The study was carried out at the Clinical Laboratory Installation of Tiara Sella Bengkulu Hospital from June to November 2016. The population and sample were couples who tested Testosterone and sperm in Tiara Sella Bengkulu Hospital from June to December 2016, as many as 39 people. Data were collected by examining testosterone and sperm hormone levels for male infertile couples from June to November 2016. Data were measurmen at mini vidas in Laboaratory Tiara Sella Hospital Bengkulu. Data were analyzed using univariate and bivariate analysis with the Chi-square test.

III. RESULTS

Table 1. Number of sperm and testosterone level

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Table 1 showed that the number of sperm quality was 22 normal, but testoterone level and testosteron level was 29 a little bit high.

Table 2 Distribution of infertile frequency and sperm count

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23 264	23	.245
Likelihood Ratio	33 602	23	.071
Linear-by-Linear Association	6743	1	.009
N of Valid Cases	39		

Table 2 showed that there was no correlation between the number of sperm infertile old

Table 3 Age frequency distribution testosterone

	value of	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39,000	36	.336
Likelihood Ratio	9,301	36	1,000
N of Valid Cases	39		

Table 3 found that there was no relationship between age and testosterone levels.

IV. DISCUSSION

This study aimed to look at the relationship between testosterone levels and the number of sperm known that testosterone levels affect sperm count. Andropause Syndrome is a physical, sexual, and psychological impairment syndrome that is associated with reduced testosterone in the blood, andropause occurs in men over middle age who have a collection of symptoms, signs, and complaints that are similar to menopause in women. Unlike women who experience menopause where ovum production, estrogen hormone production, and the menstrual cycle will stop. In men, the decrease in sperm production, testosterone, and other hormones occur slowly and gradually.

There are several factors that influence sperm count are conditions, environmental factors, and lifestyle factors. Poor sperm quality is not all affected by the male reproductive system alone, so there are some external problems such as radiation exposure, work and stress resulting in little sperm produced. However, the influential factor is the amount of testosterone. Based on the results of the analysis there was no correlation between testosterone levels and the number and quality of spermatozoa ($p > 0.05$). This shows that the testosterone obtained in the study is quite low. The hormone testosterone can reach the target cell depending on the level and ability of the SHBG bond. In other words, the SHBG protein functions to maintain the balance and dissociation of androgen binding between the circulatory system and the target cell, while the biosynthesis,

and bioavailability of SHBG are thought to be controlled by many factors. According to Rosner, the binding capacity of SHBG to the hormone testosterone greatly determines the effectiveness of the hormone in the target cells. This is because the physiological response of target cells appears when testosterone binds perfectly to SHBG. Thus the amount of testosterone bound to the transport protein is closely related to the number and quality of spermatozoa. In addition, SHBG biosynthesis by hepatoma cells (Hep-G2) in vitro is inhibited by the hormone insulin and stimulated by thyroxine and; estradiol.

Epidemiological studies also explained that SHBG was positively correlated with age, total testosterone levels, and thyroxine hormone; but negatively correlated with insulin and triglycerides, it is assumed that SHBG regulation is related to the metabolism of lipids, proteins, and carbohydrates. High androgenic activity, in obesity, seems to be associated with low levels of SHBG and a high percentage of free testosterone. In addition, levels of free SHBG and testosterone correlate positively with increased insulin. This is because high androgenic activity causes insulin abnormalities.

Spermatogenesis is highly dependent on the adequacy of a number of gonadotropin hormones namely *follicle stimulating hormone* (FSH), *luteinizing hormone* (LH), and testosterone. These hormones control the cellular process in the reproductive system which includes: ions flow, enzyme activity, protein synthesis, testosterone synthesis, and secretion, germ cell proliferation and differentiation, spermatozoa maturation, and cell-to-cell communication. Barriers to biosynthesis and transport of reproductive hormones can cause infertility in men. Especially for testosterone, the difference in work effectiveness in germ cells and other target cells is thought to depend on both levels, molecular structure, and SHBG bonding ability.

During the normal aging process in men, there is a decrease of 3 hormonal systems, namely *testosterone dehydroepiandrosteron*e (DEA) / DHEA sulfate (DHEAS), and *insulin growth factor* (IGF) and *Growth Hormone* (GH). Therefore, many experts who call andropause with other names such as: Climacterium in men, *Viropause*, *Androgen Deficiency in Aging Men* (ADAM), *Partial Androgen Deficiency in Aging Men* (PADAM), *Partial Testosterone Deficiency in* Age(PTDAM), *Andropause*(DHEA / DHEAS Deficiency), *Somatopause*(GH / IGF deficiency) and *Low Testosterone Syndrome*

Men will experience a decrease in active blood testosterone levels of around 0.8-1.6% per year when they are around 40 years of age. While at the age of 70 years, men will experience a decrease in blood testosterone levels as much as 35% of the original level. Changes in testosterone levels vary greatly from one individual to another and usually do not cause severe hypogonadism.

In this study, we found that there was no significant relationship between testosterone levels and sperm count, this is possible because many factors influence the number of sperm that is not only affected by the hormone testosterone.

The results of this study are in line with Rosner who stated that there was no positive correlation between the two variables of this study. Epidemiological studies also explained that SHBG was positively correlated with age, total testosterone levels, and thyroxine hormone, but negatively correlated with insulin and triglycerides, so it was assumed that SHBG regulation was related to lipid, protein and carbohydrate metabolism. Besides that, the levels of SHBG and free testosterone are positively correlated with increased insulin. This is because high androgenic activity causes insulin abnormalities.

However, if we look at the respondents who have a number of azoospermic sperm obtained very low testosterone levels. this also has an influence on sperm count. In normal circumstances, this is not found in this study. The results of this study also complement that the emergence of infertile male cases that have so far been unexplained is very likely to be related to testosterone levels.

V. CONCLUSION

There is no correlation between testosterone levels and sperm count in infertile couples at Tiara Sella Bengkulu Hospital.

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