Relationship of Testic Volume Towards Semen Analysis in Male Patients in Andrology Poly, RSUD Dr. Soetomo Surabaya

Ilham Masdar Apriansah¹
¹ Faculty of Medicine University of Airlangga, Surabaya, Indonesia

ABSTRACT
Examination of semen / ejaculates / sperm is the first screening examination that a subfertile / infertile couple needs to undertake in an attempt to find out the cause of infertility that may come from his side. Besides spermanalysis, it is also necessary to do physical examination, especially about internal and external genital tool because as it is known abnormal result of sperm analysis can be caused by anatomical abnormalities and or testis function. To determine the relationship of testicular volume to semen analysis on male patients in Andrology clinic RSUD Dr. Soetomo Surabaya. The research is a kind of observational analytic research to find out the correlation of testicular volume to semen analysis on male patients in Andrology clinic RSUD Dr. Soetomo Surabaya by using secondary data. Based on the results of statistical tests of 64 samples by using chi square test can be seen that the value of significance or p-value 0.005 <0.05. So it can be concluded that there is a relationship between testicular volume with morphology, motility and sperm concentration. Data were analyzed using chi square test to determine the relationship between testicular volume and semen analysis. Testicular volume is one of the risk factors of decreased semen analysis results.

Keywords: Testicular volume, sperm morphology, sperm motility, sperm concentration, semen analysis.

Correspondence: Ilham Masdar Apriansah, Faculty of Medicine University of Airlangga, Surabaya, Indonesia. Email: Ilhammasdar@gmail.com HP: 0813-3035-1596.

INTRODUCTION
The end of puberty is the stage where the testes reach the final stage in their maturation process. When it reaches this stage, the testes begin to function as secretory glands that produce spermatozoa and as an endocrine organ that is responsible for the production of testosterone which is associated with the development of male secondary sex characteristics (Wibisono, 2010).

Semen/ejaculate/sperm examination is the first screening examination that needs to be carried out by husbands of subfertile/infertile couples in an effort to find out the causes of infertility that may come from his side. In addition to sperm analysis, it is also necessary to carry out a physical examination, especially regarding the internal and external genitalia because it is known that abnormalities in the results of sperm analysis can be caused by anatomical abnormalities and or testicular function. In extreme circumstances (azoospermia) it is necessary to carry out other
supporting examinations, hormones, ultrasound, and sometimes a testicular biopsy is necessary (Wibisono, 2010).

The ejaculatory examination is basically aimed at 2 things, namely the examination of the secretions of the accessory sex glands and the cells produced by the testes (Wibisono, 2010).

In andrological examination, the sperm will be observed for shape, viscosity, color, odor, pH, and motility (rate and velocity of sperm). Even though a healthy man with thick

which is sufficient, the color and smell are normal but it is possible for a man to experience a slow speed straight to the uterus or even zero. This is caused by an imperfect sperm shape.

In a study conducted by Condorelli et al (2013), it was stated that patients with lower testicular volumes had differences with patients who had normal testicular volumes. In patients with low testicular volume, semen volume, sperm concentration and percentage of sperm motility were lower.

Because research on the relationship between testicular volume and semen analysis is still few and infrequent and to complement the existing research data, the authors are interested in examining the relationship between testicular volume and semen analysis at the Andrology Poly Hospital of Dr. Soetomo Surabaya so that it can determine whether or not there is a relationship between testicular volume and semen analysis.

**METHODS**

This research is an observational analytic study to determine the relationship between testicular volume and semen analysis in male patients at the Andrology Poly Hospital of Dr. Soetomo Surabaya using secondary data. The type of data used is secondary data, namely patient medical records at the Andrology Poly Hospital. Dr. Soetomo Surabaya for the period January 2015 – December 2015. The data obtained were analyzed based on the technique of processing and presenting bivariate data. The collected data is processed using the SPSS program. Data with nominal and ordinal measurement scales were tested with chi square to determine whether or not there is a relationship between the independent variable and the dependent variable, provided that if the p-value (significance) < 0.05 then there is a relationship, otherwise there is no relationship. Then, to determine the strength of the relationship with the contingency coefficient.
ANALYSIS AND DISCUSSION

The licensing process for this research data collection was carried out from September 2016 to December 2016. The data collection in this study was carried out in the Medical Record Room of the Andrology Poly Hospital of Dr. Soetomo Surabaya. The research data taken were from January to December 2015 with male patients as research subjects at the Andrology Poly Hospital of Dr. Soetomo Surabaya who examined semen analysis and testicular volume by prioritizing the factors studied, namely in the form of testicular volume and semen analysis which included morphology, motility and concentration contained in the medical records at the Andrology Poly Hospital Dr. Soetomo Surabaya. The total number of patients who underwent examinations at the Andrology Poly in the period January - December 2015 was 139 people. The data used for this study were only 64 people, because only 64 data met the inclusion and exclusion criteria.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Nilai Representasi</th>
<th>Satuan</th>
</tr>
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<tbody>
<tr>
<td>Volume Testis</td>
<td>64</td>
<td>16 ± 5,015</td>
<td>cc</td>
</tr>
<tr>
<td>Morphologi Normal</td>
<td>28</td>
<td>43.8</td>
<td>%</td>
</tr>
<tr>
<td>Motilitas Normal</td>
<td>26</td>
<td>40.6</td>
<td>%</td>
</tr>
<tr>
<td>Konsentrasi Normal</td>
<td>32</td>
<td>50.0</td>
<td>%</td>
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Based on the results of data analysis that has been carried out by researchers, the average testicular volume of respondents at the Andrology Poly Hospital of Dr. Soetomo Surabaya is 16cc with a standard deviation of 5.015. This is not much different from the research conducted in Albania by Kristo A, et al (2014) which found the average testicular volume of respondents was 18.15cc. Another study conducted in South India also found an average testicular volume of 16.97cc (Kumar et al, 2013). Based on the results of data analysis and sources from studies in other countries, it can be concluded that the average testicular volume has almost the same value in several countries.

The results of the research data analysis also showed the number of normal sperm morphology of the respondents at the Andrology Poly Hospital of Dr. Soetomo Surabaya by 43.8%, this is not much different from research that has been done in Italy which got the results of normal sperm morphology of 38.7% (Condorelli et al, 2013). Another study in France also found that the number of normal sperm morphology was not much different, namely 49.5% (Bujan et al, 1989).

Based on the results of data analysis that has been carried out by researchers, the number of normal sperm motility from respondents at the Andrology Poly Hospital of Dr. Soetomo Surabaya by 40.6%, this is not much different from the research conducted
was conducted in Italy which resulted in a normal sperm motility count of 50.3% (Condorelli et al, 2013). In another study in France, the number of normal sperm motility was 56.5% (Bujan et al, 1989).

Based on the results of data analysis that has been carried out by researchers, it is found that the number of normal sperm concentrations from respondents at the Andrology Poly Hospital of Dr. Soetomo Surabaya by 50.0%, this is not much different from research that has been done in Italy which got the results of a normal sperm concentration of 59.7% (Condorelli et al, 2013).

1. Analysis of the Relationship between Testicular Volume and Sperm Morphology

From the results of this study, it was found that the number of normal sperm morphology in normal and abnormal testicular volumes from the patients studied was 31.2% and 12.5%, this is in accordance with the Albanian study which showed the number of normal sperm morphology in normal and abnormal testicular volumes was around 28.7% and 14.7% (Kristo A, et al 2014). Testicular volume itself can be considered normal in size in the range of 12.5 - 19 cc (Kim, 2007). Based on the results of the study, it was found that there was a relationship between testicular volume and sperm morphology, this is in accordance with research in Italy that testicular volume can affect the decrease in sperm morphology quality (Condorelli R et al, 2013). Another study conducted by Kristo A, et al (2014) also stated that testicular volume was a risk factor for the quality of sperm morphology. This decrease in the number of normal sperm morphology by testicular volume is possible because testicular volume contributes to the production of spermatozoa (Kristo A et al, 2014).

In this study, there was a significant relationship between testicular volume and sperm morphology, this is in line with the results in a study conducted by Kristo A, et al (2014), which said that the relationship between testicular volume and sperm morphology had a significant positive relationship which had a significant positive relationship. that there is a very strong relationship between testicular volume and sperm morphology.

Another study also cited results regarding the relationship between testicular volume and sperm morphology. In a study conducted by Condorelli R, et al (2013), it was found that there was a relationship between testicular volume and sperm morphology.

It can be concluded from the results of data analysis that there is a relationship between testicular volume and sperm morphology. In the abnormal testicular volume decreased sperm morphology quality. In this study, testicular volume < 12.5 cc and > 19 cc found about 67% of patients had abnormal sperm morphology, this was possible because testicular volume contributed to the production of spermatozoa (Kristo A et al, 2014). Another possible cause of the effect of abnormal testicular volume on the decrease in semen analysis results is varicocele, patients with high-severity
varicoceles themselves have a tendency to experience testicular volume reduction, as well as an increase in temperature which results in a decrease in the quality of semen analysis results (Guzel et al, 2015).

2. Analysis of the Relationship between Testicular Volume and Sperm Motility

In this study, the amount of normal sperm motility in normal testicular volume was 29.7%, while in abnormal testicular volume, it was found that the number of normal sperm motility decreased by 10.9%. This is appropriate when compared to a study conducted in South India which found that the number of normal sperm motility in normal testicular volume was much greater than the number of normal sperm motility in abnormal testicular volume. One of the risk factors for decreased sperm motility is testicular volume, based on the results in this study, it was found that there was a relationship between testicular volume and sperm motility, this is in line with research conducted in South India which said that abnormal testicular volume decreased sperm motility. (Kumar, et al, 2013). Another study conducted in France said that abnormal testicular volume was found to decrease the number of normal sperm motility (Bujan, et al, 1989).

In this study, a significant relationship was found between testicular volume and sperm motility, this is in line with the results of statistical tests in a study conducted by (Condorelli, et al, 2013) which obtained results which stated that testicular volume and sperm motility had a significant relationship.

Another study also found that testicular volume and sperm motility had a significant relationship (Bujan L et al, 1989).

It can be concluded from the results of data analysis that there is a relationship between testicular volume and sperm motility. In the abnormal testicular volume decreased sperm motility quality. In this study, testicular volume < 12.5 cc and > 19 cc found about 66% of patients had abnormal sperm motility, this was possible because testicular volume contributed to the production of spermatozoa (Kristo A et al, 2014). Another possible cause of the effect of abnormal testicular volume on the decrease in semen analysis results is varicocele, patients with high-severity varicoceles themselves have a tendency to experience testicular volume reduction, as well as an increase in temperature which results in a decrease in the quality of semen analysis results (Guzel et al, 2015).

3. Analysis of the Relationship between Testicular Volume and Sperm Concentration

In this study, the results of the normal amount of sperm concentration in normal testicular volume were 32.8% and in abnormal testicular volumes, it was much smaller, namely 17.2%. This is in accordance with a study in Nigeria which stated that the normal amount of sperm concentration in normal testicular volume was much greater than the normal amount of sperm concentration in
abnormal testicular volume (Tijani K.H et al, 2014). Another study conducted by Manuel B.A et al (2017) also obtained almost the same results, namely the amount of normal sperm concentration in normal testicular volume was much higher than in abnormal testicular volume. Testicular volume itself is said to be normal in the range of 12.5 - 19 cc (Kim, 2007). Based on the results of this study, it was found that there was a significant relationship between testicular volume and sperm concentration. This is in line with a study in Japan which said there was a strong relationship between testicular volume and sperm concentration (Arai T et al, 1998). It is also supported by a study in Nigeria which obtained the same results, namely there was a significant relationship between testicular volume and sperm concentration, there was a decrease in the amount of normal sperm concentration in abnormal testicular volume (Tijani K.H et al, 2014).

In this study, it was found that there was a significant relationship between testicular volume and sperm concentration with positive statistical test results having a relationship. This is in line with the results of statistical tests in a study conducted by Manuel B.A, et al (2017) which found that there was a relationship between testicular volume and sperm concentration.

Another study also stated that there was a relationship between testicular volume and sperm concentration, in his study found a decrease in the number of sperm concentrations in abnormal testicular volume (Kristo A et al, 2014).

It can be concluded from the results of data analysis that there is a relationship between testicular volume and sperm morphology. In the abnormal testicular volume decreased the quantity of sperm concentration. In this study, testicular volume < 12.5 cc and > 19 cc was found about 65.6% of patients had abnormal sperm concentrations, this was possible because testicular volume contributed to the production of spermatozoa (Kristo A et al, 2014). Another possible cause of the effect of abnormal testicular volume on the decrease in semen analysis results is varicocele, patients with high-severity varicoceles themselves have a tendency to experience testicular volume reduction, as well as an increase in temperature which results in a decrease in the quality of semen analysis results (Guzel et al, 2015).

CONCLUSION AND SUGGESTION

Conclusion

Based on the results of research and general discussion, it can be concluded that testicular volume affects the quality and quantity of semen analysis. In more detail, it can be explained as follows:

1. Men with abnormal testicular volume have a risk of experiencing a decrease in the number of normal sperm morphology.

2. Men with abnormal testicular volume are at risk for decreased normal sperm motility.
3. Men with abnormal testicular volume have a risk of experiencing a decrease in the number of normal sperm concentrations.

**Suggestion**

1. Pay more attention to reproductive health, because it can affect sperm quality which can lead to infertility.

2. Reduce the use of tight pants because it can cause pressure on the blood vessels which causes the quality of sperm production to decrease.

3. Avoid bathing using hot water, bathing too often using hot water can interfere with the work of the testes and interfere with the process of sperm formation.

4. Suggestions for the Andrology Poly Hospital of Dr. Soetomo Surabaya, if found on examination of testicular volume that is smaller than the normal size, can suspect and perform an examination for varicocele.

5. Suggestions for further researchers to be better by adding the number of samples and also other variables that may have an effect

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