https://stikes-nhm.e-journal.id/OBJ/index

P-ISSN : 1979-3340
e-ISSN : 2685-7987

Jurnal Ilmiah Obsgin

Jurnal Ilmiah Ilmu Kebidanan & Kandungan

Article

DESCRIPTION OF SPERM DNA FRAGMENT WITH EMBRYO IN IVF PATIENTS

Selvia[1], Harini Nurcahya Mariandayani[2],Rina Puspita[3], Sari Artauli Lumban Toruan[4]

[1,2]National University, Indonesia
[1]Siloam Fertility and Minimal Invasive, Indonesia
[3]Sekolah Tinggi Ilmu Kesehatan Siti Khadijah, Indonesia
[4]DIII Nursing, Politeknik Negeri Indramayu, Indonesia

SUBMISSION TRACK

Recieved: February 16, 2023
Final Revision: February 28, 2023
Available Online: March 01, 2023

KEYWORDS

Infertility, Sperm DNA, IVF

CORRESPONDENCE

Phone: 082180146418

E-mail: sariartauli@polindra.ac.id

A B S T R A C T

Infertility is a condition in couples married husband and wife have had sexual intercourse regularly and adequately for more than one year without using contraception but have not had a pregnancy or offspring. Factors that cause infertility can be caused by male factors, female factors and even both. Male contributors are 40% -50%. Analysis of DNA fragmentation of sperm with embryo development aims to determine the description of DNA fragmentation of sperm with embryo development in patients with IVF programs. This study used 30 samples of married men carrying out a pregnancy program (IVF) who met the inclusion criteria.

I. INTRODUCTION

Infertility is a condition in married couples who have regular and adequate sexual intercourse for more than one year without using contraception, but have not had a pregnancy or offspring. Factors that cause infertility can be caused by men, women, or even both. Approximately 10% - 15% of couples of reproductive age experience infertility, with the contribution of the male factor, which is equal to 40% - 50% (1) (2).

One way that can be used to determine the causes of infertility in men is to do a conventional semen analysis. From the results of semen analysis in infertile men, the results can be obtained in the form of: Asthenozoospermia (percentage of motile sperm less than 40%), oligozoospermia (sperm concentration less than (15 million/ml), teratozoospermia (normal morphology less than 4%) or a combination of all three (oligoastenoteratozoospermia) (3) (4). Conventional sperm analysis has been considered as the basis of laboratory tests for the early diagnosis of male factor infertility. If semen analysis is carried out using good methods and quality, this examination can be used as an important reference

for male fertility (5) (6). The information obtained based on the parameters of conventional semen analysis reflects the process of spermatogenesis up to the trecento stage which determines the functional competence and potential fertility of sperm.

From various studies that have been developed, it is known that sperm DNA integrity also influences the incidence of infertility. Abnormalities in the paternal genome characterized by DNA damage may indicate male subfertility (7). Approximately eight percent of infertile men have abnormal DNA integrity even with normal semen analysis results. DNA fragmentation examination is an examination to assess the integrity of sperm DNA and the ability of sperm to fertilize an egg. In addition, abnormal sperm DNA integrity can also cause disturbances in embryo development, although it is not associated with poor fertilization rates (8).

In a previous study, it was found that there was a miscarriage at a sperm DNA damage rate of 37.11, which is recommended for fertilization, while for humans it is more than 30%. Standard damage to spermatozoa DNA that is not recommended for fertilization in humans is 25-30%. Damage to spermatozoa DNA in humans if it exceeds 30-40% can cause miscarriage and it is not recommended to make frozen semen.

II. METHODS

Research conducted by researchers is direct observation. The data used is in the form of laboratory results from 30 couples who did the IVF program. Laboratory results taken were spermatozoa DNA fragmentation, and patient embryogenesis results.

III. RESULT

The subjects of this study were taken from couples who underwent IVF pregnancy programs and analysis of sperm DNA fragmentation. The analysis of the characteristics of this study referred to the WHO laboratory manual for the examination and processing of human semen 2020. In this study, 30 samples were used and the images varied as shown. following :

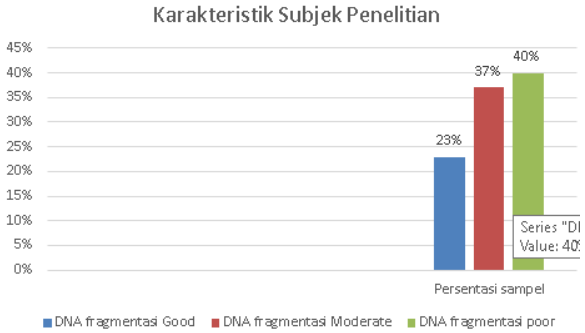

Figure 1. Characteristics of Research Subjects

From Figure 1 it can be seen that the research subjects consisted of:
•DFI poor (Interpretation of results >30%) 17 sample 40%
•DFI moderate (Interpretation of results < 30%) 6 sample 37%
•DFI Good (Interpretation of results < 15%) 7 sample 23%

The DFI value indicates the percentage of DNA fragmentation, a large IFD value indicates the amount of fragmented DNA. Of the selected subjects, the average DFI score was 28..26. All subjects consisted of 12 subjects with poor DFI, 6 samples with moderate DFI and 7 samples with good IFD.

IV. DISCUSSION

The results of this study showed that at the level of DNA fragmentation of poor sperm there were 17 samples, for medium sperm DNA fragmentation there were 6 samples and for good sperm fragmentation there were 7 samples. In examining sperm fragmentation DNA, we only read stained sperm that are still, so it is highly recommended for legal married couples if they want to carry out a pregnancy program, especially ivf to do

this sperm DNA examination, because why if a patient is found with poor DNA quality so during the sperm preparation process the laboratory assistant will be more careful in the sperm preparation process. As for patients with good DNA fragmentation results, they will usually be advised to do only IUI (9) (7).

Characteristic curve analysis (ROC) showed that the sperm DNA fragmentation rate was a statistically significant prognostic indicator of clinical fertilization rate in ICSI cycles; a rate of >22.3% was associated with a lower fertilization rate after ICSI compared with a rate of 22.3%.

This is also supported by previous studies conducted by (Baccetti et al., 1996). Although our data show that apoptotic spermatozoa can fertilize oocytes at the same rate as intact spermatozoa, the development of the resulting embryos into blastocysts and terminology is strongly related to DNA integrity. However, oocytes have the ability to repair DNA damage because oocytes fertilized by DNA-damaged spermatozoa do not develop further in vitro when they are cultured in the presence of DNA repair inhibitors (10) (11).

CONCLUSION

The results of this study showed that at the level of DNA fragmentation of poor sperm there were 17 samples, for medium sperm DNA fragmentation there were 6 samples and for good sperm fragmentation there were 7 samples.

REFERENCES

1. Smith SK, Tayman J, Swanson DA. Fertility. Springer Ser Demogr Methods Popul Anal. 2013;37:77–101.
2. Rahmadiani D. Ekstrak Pollen Kurma (Phoenix dactylifera L) Sebagai Terapi Infertilitas Pada Pria. J Ilm Kesehat Sandi Husada. 2021;10(1):31–40.
3. Ferial EW, Soekendarsi E, Utami IP. Deteksi Dini Suspek Infertilitas Berdasarkan Analisis Makroskopik Spermatozoa Manusia. Pros Semin Nas Biol dan Pembelajarannya. 2018;437–42.
4. Mundijo T, Alfredo Ilyasa M, Dwi Agustine A. PENGARUH USIA PRIA TERHADAP HASIL ANALISIS SEMEN The Effect of Men's Age on Semen Analysis. Mesina. 2021;2:40–7.
5. 60270479-0593-481b-b708-444848ddd40d.tmp.
6. 21234-kajian-infertil-pria-dl-laboratorium-inf-ff704fd8.pdf.
7. Lestari SW, Sari T. Fragmentasi DNA Spermatozoa: Penyebab, Deteksi, dan Implikasinya pada Infertilitas Laki-Laki Sperm DNA Fragmentation: Etiology, Detection and Implication to Male Infertility. Triyana Sari eJKI.
8. Priyanto L, Budiyanto A, Kusumawati A, Arifiantini I, Studi Peternakan Fakultas Pertanian Universitas Sriwijaya Palembang Sumatera Selatan P, Kedokteran Hewan Universitas Gadjah Mada Yogyakarta DIY F, et al. Perbandingan Pemeriksaan Kerusakan DNA Spermatozoa Post Thawing antara Sperm-Bos-Halomax ® dan Toluidine Blue Comparison of Post Thawing Spermatozoa DNA Damage Examination Between Sperm-Bos-Halomax ® and Toluidine Blue. J Peternak Sriwij. 2018;7(1):30–9.
9. Yeyen Suharta IG, Junitha IK, Alit Sukmaningsih AAS. Dna Hasil Ekstraksi Dari Bercak Sperma Pada Kain Katun Dan Poliester Yang Disimpan Hingga 40 Hari. Simbiosis. 2021;9(2):94.
10. Pengajar S, Biologi J, Jember U. Kajian ekspresi protein bax pada gangguan spermatogenesis pasca pemaparan 2,5-hexanadione, pada tikus putih. 1996;1–5.
11. Kaiin EM, Gunawan M. Kualitas sperma sapi hasil sexing setelah kapasitasi secara in vitro. Pros Sem Nas Masy Biodiv Indon. 2017;3:466–70.