COUNSELING AND SEMEN ANALYSIS OF THE COVID-19 SURVIVORS IN INDRAPURA HOSPITAL, SURABAYA

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ABSTRAK

Pandemi coronavirus disease (COVID-19) telah menjadi masalah di seluruh dunia. diketahui bahwa COVID-19 dapat mempengaruhi banyak organ dalam tubuh manusia, seperti paru-paru, ginjal, jantung, dan testis. Efek COVID-19 pada kesuburan pria masih menjadi kekhawatiran oleh para penyintas. Kegiatan pengabdian masyarakat ini bertujuan untuk memberikan edukasi dan informasi kepada para penyintas COVID-19 mengenai dampak infeksi pasca-COVID-19 terhadap kesuburan pria. Kami melakukan sesi konseling dan analisis semen para penyintas COVID-19 di RS Indrapura, Surabaya, untuk menginformasikan dan mengevaluasi pengaruh penyakit tersebut terhadap kesuburan mereka. Sebanyak 10 peserta setuju untuk memeriksakan spermanya di Unit Andrologi RS Soetomo Surabaya. Sebelum pemeriksaan, kami melakukan penyuluhan dan edukasi masyarakat kepada para Survivor COVID-19 di RSUD Indrapura dengan menggunakan platform *zoom meeting*. Konseling yang kami berikan menjelaskan bagaimana COVID-19 dapat memengaruhi status kesuburan pria dan bagaimana melakukan aktivitas seksual yang aman selama pandemi. Hasil dari analisis semen didapatkan *teratozoospermia* 70%, *oligoashtenozoospermia* berat 10%, *oligozoospermia* berat 10%, dan *azoospermia post centrifuge* 10%. Konseling dan analisis semen para penyintas COVID-19 merupakan langkah penting dalam mengedukasi dan mengevaluasi status kesuburan pria. Partisipan diinformasikan dan memahami status kesuburannya setelah terinfeksi COVID-19.

Kata kunci: konseling, coronavirus, pandemi, analisis semen, kesuburan pria

ABSTRACT

The coronavirus disease (COVID-19) pandemic has been a problem worldwide. It has been known that COVID-19 could affect many organs in the human body, such as the lungs, kidneys, cardiovascular, and testes. The effect of COVID-19 on male fertility is still a concern for many survivors.
This community service activity aims to provide education and information to COVID-19 survivors regarding the impact of post-COVID-19 infection on male fertility. We do a counseling session and semen analysis of COVID-19 survivors in Indrapura Hospital, Surabaya, to inform and evaluate the effect of the

disease on their fertility. A total of 10 participants agreed to check their semen in Andrology Unit, Soetomo Hospital, Surabaya. Before the examination, we performed community counseling and education of the COVID-19 Survivors in Indrapura Hospital using a zoom meeting. The counseling we give explains how COVID-19 could affect male fertility status and how to do safe sexual activity during pandemics. The results of the semen analysis are teratozoospermia 70%, severe oligoashtenozoospermia 10%, severe oligozoospermia 10%, and azoospermia post centrifuge 10%. Counseling, and semen analysis of the COVID-19 survivors is an essential step in educating and evaluating male fertility status. Participants were informed and understood their fertility status after being infected by COVID-19.

***Keywords**: counseling, coronavirus, pandemic, semen analysis, male fertility*

1. INTRODUCTION

The coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been a global problem since its first encounter. Until May 2021, it has 162.704.139 confirmed cases and causing 3.374.052 deaths worldwide. In Indonesia itself, it has 1.739.750 confirmed cases and 48.093 deaths (World Health Organization, 2021). The pandemic affects couples in Indonesia, whether they have less frequency of sexual activity and decreased desire to have children. This is due to the fear of the pandemic to their life stability (Tribowo, 2021).

COVID-19 has many symptoms, such as sore throat, fever, cough, loss of smell, and malaise, while some patients are asymptomatic (Komagamine, 2020). There is still further study to evaluate the effect of COVID-19 on the human body.

A previous study showed various virus infections could be detected in the male reproductive system and damage the male fertility status (Liu, 2021). One of the concerns for the COVID-19 effects is male fertility. It has been known that SARS-CoV-2 uses the angiotensin-converting enzyme 2 (ACE2) receptor as its host receptor. Besides respiratory organs, ACE2 is very high in the human testis (Youni, 2020). COVID-19 could affect male fertility from direct infection or treatment-related when the patient is still in the acute phase (Gacci, 2021).

A study found that SARS-CoV-2 could be present in male semen infected with COVID-19, while other studies found no evidence of it. (Li, 2020; Gacci, 2021; Burke, 2021; Best, 2021). Previous studies exploring the impact of COVID-19 on male semen parameters at various timescales since the study sample was confirmed positive showed a decrease in semen analysis parameters in concentration and motility (Guo et al., 2021; Holtmann et al., 2020).). Meanwhile, other studies did not find a significant decrease in semen analysis parameters (Ma et al., 2021; Rahman et al., 2021). There are inconsistent results regarding the effects of COVID-19 on the male reproductive organs from the existing study. This raises the question of whether COVID-19 could impact male fertility.

Infertility is when a couple fails to achieve pregnancy within one year without using any protection during intercourse. Primary infertility is a condition in which no pregnancy ever happens, while secondary infertility is when no further pregnancies happen (Nieschlag, 2010). Several factors could cause male infertility, such as environmental, lifestyle, and

occupational. To evaluate the male's fertility status, we need to check the semen quality (Dissanayake, 2019).

Infertility is also a common problem affecting couples around the world. The cause of infertility could be male or female factors or both. Around 30 million men worldwide are infertile, which raises concern for awareness of male infertility (Agarwal, 2019).

During the pandemic, plenty of misinformation related to COVID-19 spread in Indonesia (Rahmawati, 2021). This leads to many people having misleading information about COVID-19, especially the COVID-19 survivors who need proper information about their health. This community service activity aims to provide education and information to COVID-19 survivors regarding the impact of post-COVID-19 infection on male fertility.

2. MATERIAL AND METHODS

To find if there is any reproductive impact on COVID-19 survivors, we examine their semen analysis after 2-7 days of abstinence. Participants are informed about washing hands before masturbating for the semen collection. The semen analysis was performed in the Andrology Unit, Dr. Soetomo Hospital, Surabaya, using Perhimpunan Spesialis Andrologi (PERSANDI) 2010 guidelines to interpret semen parameters.

We collaborate with Indrapura Hospital Surabaya for the examination. Indrapura Hospital has been one of the COVID-19 reference hospitals in East Java since May 2020. The inclusion criteria for the participants are a minimum age of 17 years old, willingness to check their semen, and has been recovered from COVID-19.

Picture 1. Socialization of community service activities in Indrapura Hospital Surabaya

Before the examination, we performed community counseling and education of the COVID-19 Survivors in Indrapura Hospital using a zoom

meeting. The counseling we give explains how COVID-19 could affect male fertility status and how to do safe sexual activity during pandemics. We also inform the importance of checking semen analysis to know the fertility profile. The online counseling was delivered by dr. Supardi, Sp.And (K) as the head of Andrology Unit in Dr. Soetomo Hospital.

Picture 2. Online zoom meeting to give information about COVID-19 effects on male fertility

After the semen analysis, we also do private counseling with the participant to inform them of the result and further evaluation if needed. Participants with infertility history are given information about the treatment and planning for their fertility. All of the participants are recommended to perform another semen analysis after three months to re-evaluate their semen parameters.

3. RESULTS

There are 87 COVID-19 survivors attended the online counseling, and ten people were willing to check their fertility status through semen analysis. The counseling was held on 19 October 2020 using a zoom meeting, and the semen analysis was performed between November 2020-February 2021. Most of the participants are married, where 44.4% have primary infertility and 22.2% have secondary infertility.

Picture 3. Counseling with COVID-19 survivor

Table 1. Characteristics of the Participants

Variable	
Total participants (n)	10
Mean age	37.60 ± 7.834
Mean couples age	37.44 ± 5.525
Mean marriage duration	9.11
Marital Status	
Married	9 (90%)
Not Married	1 (10%)
Primary Infertility	
Yes	4 (44.4%)
No	5 (55.6%)
Secondary Infertility	
Yes	2 (22.2%)
No	7 (77.8%)

Picture 4. Semen analysis examination

The semen analysis results are found 70% teratozoospermia, 10% severe oligoashtenozoospermia, 10% severe oligozoospermia, and 10% azoospermia post centrifuge. After the participants had their semen analysis results, they were given information about the interpretation and possible treatment. The treatment includes lifestyle modification and medication if needed.

Table 2. Semen Analysis Results

Semen Analysis Interpretation	Results
Teratozoospermia	7 (70%)
Severe Oligoashtenozoospermia	1 (10%)
Severe Oligozoospermia	1 (10%)
Azoospermia Post Centrifuge	1 (10%)

4. DISCUSSION

Infertility is still a problem for couples who want to achieve pregnancy. The common cause of infertility is 39% female factors, 20% male factors, 26% both partners, and 15% idiopathic. A proper semen analysis is needed to check the male characteristics, as good quality sperm are required to process fertilization (Nieschlag, 2010). Our data above showed that all participants have impairment in their semen analysis.

Many factors could cause male infertility, such as systemic pathologies, environmental and lifestyle factors, and genitalia tract pathologies. A proper further examination is needed to evaluate the cause of male infertility (Rizk, 2019).

Factors that influence the semen quality include testes, accessory organs, illness, and abstention time (World Health Organization, 2010). It is known that COVID-19 infection can have different effects on the male reproductive system (Abdel-Moneim, 2021). SARS-CoV-2 could alter male fertility by affecting semen parameters, increasing DNA fragmentation of spermatozoa, and testicular inflammation (Omolaoye, 2021; Li, 2020).

COVID-19 severity may also affect the semen parameters. The study found that patients with mild symptoms will decrease motility and vitality, while moderate symptoms will decrease in all semen parameters (Erbay, 2021). It is also essential to distinguish whether the abnormalities in the semen analysis are caused by COVID-19 or other causes before. SARS-CoV-2 uses the ACE2 receptor to enter the cells. It is known that the ACE2 receptor is high in the testes, so that it could damage the cells there. Besides that, many factors such as immune and cytokine response and higher temperature will impair male reproductive systems (Verma, 2020; Meng, 2021).

The mechanism by which COVID-19 affects the male reproductive organs is not yet fully understood. All male reproductive organs are potentially infected, but infections of the testes and epididymis are more common. The effect on the testes and epididymis can be direct or indirect. The direct effect is caused by the attack of viral particles that reach the reproductive organs during viremia. Indirect effects can occur due to the high fever experienced and the presence of inflammatory mediators. The magnitude of the influence on the function of reproductive organs and semen parameters is mainly determined by the degree of viremia and the specific conditions of each person (Zafar et al., 2021).

In COVID-19, seminiferous tubules have higher cell apoptosis and reduced Leydig cells than non-COVID-19 (Li et al., 2020). In a post mortem study of severe COVID-19 cases, there were histological changes, including orchitis, vascular changes, reduced Sertoli and Leydig cells, thickening of the basement membrane, reduced spermatogenesis, and increased inflammatory lymphocyte cells (Duarte-neto et al., 2022; Moghimi et al. al., 2021)

Disruption of the steroidogenesis that could alter the level of follicular stimulating hormone (FSH), luteinizing hormone (LH), and testosterone level also will disrupt spermatogenesis (Zafer, 2020; Selvaraj, 2020). Further studies about how far COVID-19 could affect male fertility are still in progress, as it is known that COVID-19 could impair the male reproductive system directly or indirectly (Hinting, 2020).

In this community service activity, we found all the participants have impairment in their semen parameters. But we don't know whether the impairment already happened before the COVID-19 infection or if the COVID-19 caused it. Participants didn't have any semen analysis before being infected, so there is no comparison for the current examination. Four participants with primary infertility have semen analysis results in severe oligoashtenozoospermia, severe oligozoospermia, azoospermia post centrifuge, and teratozoospermia. Two participants with secondary infertility have semen analysis result in teratozoospermia. These semen parameters impairment could contribute to infertility, besides from the female factors.

COVID-19 survivors need proper education and treatment about their fertility status, especially for couples who still want to achieve pregnancy. Lifestyle modifications such as weight control, adequate sleep, and stress management should be advised. Supplementation of vitamins and antioxidants could be given if there is any indication, as there is evidence that oxidative stress could alter sperm quality (Karavolos, 2020). An assisted reproductive technique (ART) can also be advised to couples with some consideration, such as altered sperm concentrations. ART selection

for infertility include intrauterine insemination, in vitro fertilization, and intracytoplasmic sperm injection (Tournaye, 2012).

In Indonesia, there is plenty of misleading information about COVID-19, such as the virus origin and transmission, trusted by people (Nasir, 2020). This needs to be a concern since people will misbehave if they get the wrong information. The use of webinars and private counseling in this community service activity will give them proper information, especially for the COVID-19 survivors. It is well known that webinars session is one of the solutions during the pandemic to give the public knowledge about proper COVID-19 information (Diyanah, 2021).

The semen analysis result will give information for the COVID-19 survivor, especially those with infertility. They become aware of their fertility status and get proper treatment and planning for their fertility problem. Further re-evaluation of the semen analysis is needed to evaluate any alteration in semen parameters of the COVID-19 survivors in the long term.

5. CONCLUSION

COVID-19 could impact male fertility status directly and indirectly. Counseling and semen analysis of the COVID-19 survivors are essential steps in educating and evaluating male fertility status. Participants were informed and understood their fertility status after being infected by COVID-19. Further re-evaluation of the semen analysis was also advised to the participants to check if there were any long-term effects on their semen parameters.

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