

ADOLESCENT PERIOD CHANGES POST COVID-19 INFECTION AND VACCINATION : CROSS SECTIONAL STUDY

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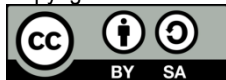
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ABSTRACT

Background: Covid-19 infection has been followed by several post-impacts. As well as vaccination, can also provide some effects, named Adverse Event After Immunization. **Objective:** This research aims to investigate to analyse period changes in adolescent who have been infected covid-19 infection and vaccinations. **Method:** This is a cross-sectional survey-based research, the number sample is 271 adolescent in Yogyakarta who have been infected with Covid-19 to fill-out the study questionnaire. **Results:** The study was consist of adolescent, age 13-17 years old. Results showed that 52,7% post-covid infection (n = 143), 94 (65,7%) have a change in the amount of days between two periods, as well as from a change in the amount of blood loss. And then 66,8% post-vaccination (n = 181), 113 (62,4%) have a change in the amount of days between two periods, as well as from a change in the amount of blood loss. **Conclusions:** This Study revealed that Covid-19 infection and vaccination could be effect the adolescent period. Further prospective research should be done to evaluate how long the irregularities period

Keywords: Adolescent, Period, Covid-19, Vaccination.

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INTRODUCTION

Covid-19 has had both direct and indirect impacts on countries around the world. Due to its rapid transmission, the virus has, at times, overwhelmed healthcare systems (WHO, 2021). The pandemic has significantly influenced the health of individuals across all age groups, affecting both physical and mental well-being. Children and adolescents have faced numerous challenges and restrictions associated with Covid-19, which have disrupted their daily routines. Reduced outdoor activities and increased screen time, such as watching movies at home, have contributed to various health concerns among this age groups (Rasheed, 2022). symptoms of Covid-19 usually begin with feverishness, drowsiness, dry cough, arthralgia, myalgia, septic throat, anosmia, diarrhea, vomiting, and some neurological symptoms. These symptoms can persist for some time even after cure

and these symptoms, which are known as long term covid-19 effects or post covid syndrome. Some studies have shown that one of the long term symptoms of covid-19 is menstrual cycle disorders in women (Hai Yang Wang, 2020) (Matthew F Pulen, 2020). The menstrual cycle is a woman's biological cycle with varying cycle lengths (26-35 days) in each individual. That controlled by endocrine, autocrine and paracrine factors. This affects women's reproductive conditions, and usually associated with several problems, including : lower abdominal pain, heavy bleeding and premenstrual syndrome (PMS). It greatly influences women's psychics, temper and behaviours, but these impacts are different for each woman (Pratyusha R Gudipally, 2024). In the latest research, showed that women aged 18-30 years experienced changes in their menstrual cycle changes after Covid-19 (Trogstad, 2022, Ida Henriette Caspersen, 2023), such changes are also common before vaccination. The aim of this study

is to estimate the relationship between Covid-19 vaccination and menstrual disorders in girls aged 13-17 years using cross sectional study.

METHOD

This research is cross sectional survey-based study conducted between 22nd January- 30th January to analyze changes in menstruation in adolescents after covid-19 infection. we used google form questionnaire to collect of the data from 271 adolescents aged 13-17 years old in Yogyakarta who had infected with Covid-19. The sample was selected by Purposive sampling.

RESULTS

Table 1 Overview of The Result (271)

Table 1 Covid-19 with Menstrual Cycle

Covid-19	Menstrual Cycle		Total	P-Value
	Normal	Unnormal		
Covid-19	49	94	143	0,000
Non Covid-19	70	58	128	
Total	119	152	271	

Table 2 Overview of The Result (271)

Table 2 Covid-19 Vaccination with Menstrual Cycle

Vaccination Covid-19	Menstrual Cycle		Total	P-Value
	Normal	Unnormal		
Vaccine	68	113	181	0,000
Not Vaccine	53	37	90	
Total	121	150	271	

DISCUSSION

Over the last three years the world has faced of a terrible disease due to the covid-19 pandemic which has caused millions of deaths and long-term impacts. After Covid-19 infection, people who recover worry about the loss of scent, loss of flavor, loss of appetite, and other symptoms. Recently, there have been scientific reports and discussions on social media that many women infected with covid-19 suffer from changes in the menstrual cycle (Mohammad A A Al-Najjar, 2022).

The menstrual cycle is a complex interaction of the hypothalamus, pituitary, ovaries, uterus, prostaglandins, and neuroendocrine. Therefore, the menstrual problem can be caused by disruption of one of these interactions (J.L, 1997).

Almost 65% teenage girls who have been infected with Covid-19 experience problems during menstruation. Covid-19 caused systemic inflammation, it will lower the circulation of 25(OH) D resulting in vitamin D deficiency (Gorji A, 2021, Smolders J, 2021). Insufficient Vitamin D levels in the body can cause problem in the menstrual cycle, either amenorrhea or oligomenorrhea (Thomson RL, 2012, Lagowska, 2018). Furthermore, problem on menstrual bleeding can be caused by the psychological disturbance (stress and depression) (Oriol KA, 1999). Previous research in the United State found that Covid-19 triggers stress which may be a factor causing changes in menstrual cycle. In that research, found that woman showed a high scale of perceived stress, while also reporting significant changes in their menstrual bleeding during the Covid-19 pandemic (Ozimek N, 2021).

The menstrual cycle represents an intricate interplay among diverse tissues, hormonal factors, and organ systems. This complexity renders the menstrual cycle highly susceptible to both internal and external influences. Research findings demonstrate that SARS-CoV-2 infection, pandemic-related psychological distress, and COVID-19 immunization can all impact menstrual patterns (Phelan N, 2021). Multiple biological pathways elucidate the relationship between acute immune responses, such as those triggered by vaccination, which systematically alter hemostatic processes and trigger inflammatory cascades, and menstrual physiology (Evans J, 2012, Talaat KR, 2018, Berbic M, 2013). Menstruation has quite a lot of characteristics of an inflammatory process. The complexity and sequence of events inflammatory-type and leukocyte types change greatly through the menstrual cycle, are causing damage to the endometrium which referred to as bleeding. Leukocytes have various function related

to mucosal protection, damage, repair and remodeling. Progesterone demonstrates anti-inflammatory characteristics, with its concentrations dropping sharply during the late secretory phase of non-fertile cycles, triggering a cascade of inflammatory responses through local cellular communications within the endometrial tissue. Given comparable immune-activating mechanisms, menstrual disruptions have been documented with other vaccines, including those for Hepatitis B and human papillomavirus. Therefore, it appears logical to hypothesize similar inflammatory pathways following both acute COVID-19 infection and vaccination (Aya Mohr Sasson, 2023).

Several constraints limit the scope of this investigation. The distribution of questionnaires via social media platforms introduces potential biases inherent to cross-sectional research design, particularly recall bias among participants. Additionally, the utilization of purposive sampling methodology through social media channels may result in selection bias, thereby restricting the applicability of findings to the broader population. To validate these observations and determine the duration of menstrual disruptions, future research should employ prospective longitudinal study designs.

CONCLUSION

This cross-sectional survey-based investigation demonstrated that both SARS-CoV-2 infection and COVID-19 vaccination may influence menstrual patterns among female adolescents aged 13-17 years.

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