ANALYSIS OF ANTIBODY RESPONSE TO SARS-COV-2 VACCINATION
AND ITS RELATION WITH AGE IN PATIENTS AT PRODIA ARTERY

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ABSTRACT
One of the efforts to overcome Covid-19 is the vaccination program. Anti-SARS CoV-2 is an antibody against Sars-CoV-2 formed due to previous exposure to Covid-19 infection or due to the administration of the Covid-19 vaccine. This study aims to determine the average number of Anti-Sars-CoV-2 respondents vaccinated against Covid 19 and the relationship between age and the number of Anti-Sars-CoV-2. This research is a quantitative study with an observation method with a cross-sectional approach which means looking for a relationship between the independent variable and the dependent variable, and this study uses secondary data. The results of this study indicate that more than half of the respondents (52%) are male, while based on the most common age group is 36-45 (48%), the average value of Anti Sars Cov-2 is 92.76%, with the lowest value 5.1 U/ml and the highest value 250 U/ml, statistical test results show that there is no age relationship with levels of Anti-ars-Cov-2. Suggestion: Further research is needed by looking at other predictors that affect levels of Anti Sars-Cov-2.

Keywords: Anti SARS COV-2, Covid -19, SARS COV, Vaccination

INTRODUCTION
The Covid-19 pandemic in the World and Indonesia since the beginning of 2020 is still happening. In Indonesia, the case is very volatile, where at certain times, the number increases but can slope or decline. As of March 8, 2022, there were 5,800,253 positive cases, 150,831 deaths, and 5,226,530 recovered cases. This proves that the Covid-19 pandemic in Indonesia has not been controlled until now. The Government has made several efforts to overcome Covid-19, including Large-Scale Social Restrictions/Pembatasan Sosial Berskala Besar (PSBB), Authorization of Limitations on Community Activity/ Pemberlakuan Pembatasan Kegiatan Masyarakat (PPKM), 3M (Washing hands, Wearing masks, Maintaining distance), to increasing to 5M (Washing hands, Wearing masks), Keeping a distance, Staying away from crowds, Reducing Mobility) and 3T (Testing, Tracing, Treatment), and Vaccination Programs. Although the Government has carried out these policies, the Covid-19 pandemic in Indonesia has not ended (Ministry of Health, 2022).

The COVID-19 vaccine is available in Indonesia. The Government has started to break the chain of transmission of the coronavirus contamination and stifle the number of COVID-19 cases, which is still expanding, and the Government has started a vaccination program to break the chain of spread. When somebody gets a antibody, the body will shape a particular immunity against the infection the antibody can avoid. This person's immune framework will battle the bacteria or virus that causes the infection that enters so that contamination does not happen. In case a individual vaccinated gets to be
contaminated with COVID-19, the indications will be lighter, and the recuperation will be quicker. (Tamara, 2021)

Covid-19 vaccination is currently the focus in Indonesia to achieve Herd Immunity. Herd Immunity or population immunity is the concept of protecting the population from viruses through a vaccination program with a target vaccination coverage threshold reached (WHO, 2020). Herd immunity is said to be achieved if 70% of Indonesia’s population has received vaccinations. With the achievement of the Covid-19 vaccination program nationally, the coverage of dose 2 vaccination has reached the level of 70.38%, or 146,577,204 doses, from the target of 208,265,720 residents. Acceleration and expansion of national vaccination coverage continue to be key strategies to suppress COVID-19 in Indonesia. In addition to the news that vaccination coverage has reached a high level, national hospital patients also fell today to 31% (4/3) from the previous day at 32% (3/3). (Ministry of Health, 2022)

Anti-SARS CoV-2 is an antibody against SARS-CoV-2 formed due to exposure to a previous Covid-19 infection or due to the administration of the Covid-19 vaccine. To see the SARS-CoV-2 antibodies formed after vaccination, a quantitative Anti-SARS-CoV-2 examination is needed. Quantitative Anti-SARS-CoV-2 can see the immunogenicity of the Covid-19 vaccine as seen from the increase in the number of antibodies formed after vaccination. Anti-SARS-CoV-2 Quantitative Examination can measure the SARS-CoV-2 antibody to the S-RBD protein. The S-RBD protein is the main target of neutralizing antibodies against SARS-CoV-2 and has a role in closing the entry pathway and preventing viral replication. Anti-SARS-CoV-2 Quantitative assay is specific with high affinity and can measure total antibody. Zhang et al. stated that antibodies formed after vaccination varied greatly. This was influenced by various factors, including age, comorbidities, treatment history, and type of vaccine. The time range for forming antibodies starts from 14 to 28 days after the 2nd vaccination. Even in some cases, the SARS-CoV-2 antibody was not detected even though it was 28 days after vaccination (Cobas, 2021). The antibody response in each individual after vaccination varies, including no antibody response, less antibody response, and good antibody response. In the absence or lack of an antibody response, the body cannot prevent the disease properly, so an increase in the dose or revaccination is considered. As with other vaccines, an increase in the dose of the vaccine or revaccination may be necessary for individuals with unfavorable antibody responses. The protection period for the Covid-19 vaccine is still unknown, and further research is needed. Quantitative Anti-SARS-CoV-2 examination can be carried out one to six months after the vaccine series (Ophinni Y, Hasibuan A, et al., 2020). There are substantial differences between individuals in the immune response to vaccination. There are substantial differences between individuals in the immune response to vaccination. Several studies have been conducted that have identified factors that influence human humoral and cellular responses. Intrinsic factors (such as age, sex, genetics, and comorbidities), perinatal (such as gestational age, birth
weight, method, and maternal factors), and extrinsic (such as pre-existing immunity, microbiota, infection, and antibiotics).

Furthermore, natural factors (such as geographic area, season, family measure, and toxins), behavioral components (such as smoking, alcohol consumption, work out, and rest), and nutritional factors (such as body mass file, micronutrients, and enteropathy) moreover impact how people react to vaccines. In expansion, vaccine factors (such as vaccine sort, product, adjuvant, and dosage) and organization components (schedule, place, course, timing of vaccination, and co-administered vaccines and other drugs) are moreover imperative. Understanding these factors and their affect on vaccination plan and choices almost vaccination plans offers a way to make strides antibody immunogenicity and efficacy (Zimmermann, 2019).

This study aims to determine the relationship between age and the number of respondents’ Anti-SARS Cov-2, which can affect the number of antibodies after Covid-19 vaccination

METHOD

This research uses quantitative research with an observation method with a cross-sectional approach, which means looking for the relationship between the independent variable and the dependent variable, and this study uses secondary data. This research was conducted at the Prodia Artery Laboratory from April 2022-May 2022.

The population of this study was all 30 employees of Prodia Artery. Sampling in this study used a purposive sampling technique. The inclusion criteria are employees who have never been exposed to two doses of vaccination, while the exclusion criteria are employees who have been exposed to SAR-CoV-2, who have been vaccinated, and employees who have not been vaccinated.

The data were collected using secondary data, which the researcher previously applied for permission to the Prodia Artery Clinical Laboratory and analyzed univariately and bivariably with the Spearman Correlation test.

RESULTS AND DISCUSSION

From the research data on the 30 sample populations studied, the research samples that met the inclusion criteria were 25 samples. From the data above, the distribution of sex and age of research subjects, namely Prodia Arterial employees who have been vaccinated and meet the inclusion criteria as shown in table 1 below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>

| Table 1. Distribution of Respondents by Gender |
Based on the gendered character, in the study, it was found that more than half (48%) were male. The table below shows that the age of the participants in the study above is 24-52 years old, where the levels of Anti Sar Cov 2 ranged from 5.15 U/ml to 250 U/ml.

**Table 2. Based on Age**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average and SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti SAR CoV-2</td>
<td>5.15 U/ml</td>
<td>250.00 U/ml</td>
<td>92.76±81.95U/mL</td>
</tr>
<tr>
<td>Age</td>
<td>24 years</td>
<td>52 years</td>
<td>36 ±7.64 years old</td>
</tr>
</tbody>
</table>

Based on the research results on the relationship between age and levels of Anti-Sars-Cov-2, the p-value of 0.443 was <0.05, so H0 was accepted, and H1 was rejected. This shows no relationship between age and levels of Anti Sars-Cov-2. This condition follows previous research conducted by Shidqy Muhammad, 2022, namely a study to see the age of the Sars-Cov-2 antibody where the p-value = 0.192 showed no relationship between age and antibody levels after vaccination.

**Table 3. Age Relationship with Anti Sars-Cov-2, Levels**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Amount</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>25</td>
<td>0.443</td>
</tr>
</tbody>
</table>

The absence of a relationship between age and levels of Anti Sars-Cov-2 can be caused because the respondents have an adult age range. Innate and adaptive immune cells that play a role in the immune response in adults work actively to recognize and produce immune responses, which shows good thymus function. In response to immunity (Merry Y.A, 2017).

**CONCLUSIONS AND SUGGESTIONS**

More than half of the respondents (48%) are male. The average value of Anti-sars Cov-2 was 92.76%, with the lowest value of 5.1 U/ml and the highest value of 250 U/ml. There is no relationship between age and levels of Anti Sars-Cov-2. Further research is needed with other variables related to levels of Anti Sars-Cov-2

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**REFERENCES**


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