



Description of Antiviral Usage in Covid-19 Patients at One of COVID-19 Referral Hospital in Semarang City

Arik Dian Eka Pratiwi^{1*}, Dhimas Adhityasmara¹, Erna Prasetya Ningrum¹

¹Department of Pharmacology and Clinical Pharmacy, Sekolah Tinggi Ilmu Farmasi Yayasan Pharmasi Semarang, 50192, Indonesia

Corresponding author's email: arikdianekapratiwi@stifar.ac.id

ABSTRACT

COVID-19 is a pandemic that is causing increasing health burdens almost all over the world, and until the outbreak of the virus spreads, no effective therapy has been found to deal with the infection. As a result, effective antiviral therapy is needed to inhibit the spread of viral transmission. Several therapeutic drugs have been explored for COVID-19 therapy. Several therapeutic drugs have been explored for COVID-19 therapy. The goal of this study was to identify description of antiviral usage in medication of COVID-19 patients. This study was an observational study that retrospectively used medical records and drug usage records of 105 patients diagnosed as positive for COVID-19 and receiving antiviral medication during the June to December 2020 period. The results showed that the most widely used antiviral was favipiravir (34.30%) in a single administration, while the most commonly used combination was Favipiravir and Remdesivir (11.00%). For each patient, the clinical condition, dose, and duration of medication were adjusted. This research was very useful in obtaining information for pharmacists, especially those working in health services, especially in hospitals, in monitoring therapy and the effectiveness of antiviral usage so that they could help improve the patient's condition.

Keywords: Antiviral; Favipiravir; Remdesivir; COVID-19 Medication

1. INTRODUCTION

COVID-19 is a disease caused by a novel strain of the SARS coronavirus 2 (SARS-CoV-2) that emerged in Wuhan, China. The World Health Organization (WHO) proclaimed this illness a pandemic on March 11th, 2020 [1]. As a result, patients confirmed to be COVID-19 pandemic increased to 10 million cases worldwide in July 2020 [2].

COVID-19 is a pandemic that is causing increasing health burdens almost all over the world, and until the outbreak of the virus spreads, no effective therapy has been found to deal with the infection. As a result, effective antiviral therapy is needed to inhibit the spread of viral transmission [3]. Several therapeutic drugs have been explored for COVID-19 therapy, but no antiviral therapies have been shown to be clinically effective [4].

There was no effective treatment for SARS-CoV-2 prior to the spread of the pandemic. Only supportive care is thought to result in minor improvements. As a result, a number of studies were conducted to find effective treatments using various substances and processes. There

have been over 200 clinical trials on the efficacy and safety of antiviral drugs against SARS-CoV-2. A number of antiviral drugs, both approved and experimental, have been identified as potentially therapeutic. Then, in May 2020, remdesivir (RDV), a SARS-CoV-2 polymerase inhibitor [5], was granted an emergency use authorization (EUA) [4], for intravenous (IV) therapy in hospitalized patients [4]. A recent trial of IV RDV indicated that it decreased hospitalization by 80% [6].

The antiviral combination of lopinavir and ritonavir has received extensive research and is thought to have potential effectiveness in the treatment of COVID-19. Lopinavir is a protease inhibitor that decreases viral load by preventing viral replication in host cells [7][8], whereas ritonavir is used in conjunction with lopinavir to boost its efficiency and half-life by inhibiting cytochrome p450 [9]. This combination drug has already been licensed for the treatment of HIV and MERS infections, and it has been shown to be effective against SARS-CoV-2 [10]. Favipiravir is a drug that was once approved for the treatment of influenza virus infection because it effectively inhibits the RNA-dependent RNA

polymerase that is found in influenza, norovirus, and Ebola viruses. As a result of the active substance's ability to render SARS-CoV-2.4 inactive, the virus is unable to enter the cell because it is inhibited by RNA-dependent RNA Polymerase. As a result, the process of virus transcription and replication is disrupted [11], [12].

Chloroquine (CQ) and hydroxychloroquine (HCQ) were found to have antiviral activity by increasing lysosome PH, which inhibits the entry of the virus into endocytic cells [13], [14], as well as altering the glycosylation process of angiotensin converting enzyme 2 (ACE2) receptors, which prevents the fusion of viruses with host cells both before and after infection [15]. Some studies show that HCQ has better safety characteristics as a therapy against SARS-CoV-2 than CQ [16]. Oseltamivir is a neuraminidase inhibitor and oseltamivir carboxylate prodrug with increased antiviral activity against influenza viruses A and B. During the COVID-19 epidemic in China, it was administered alongside other compounds such as antibacterial and corticosteroids [17], [18].

The goal of this study was to determine how antivirals were used at one of Semarang's COVID-19 referral hospitals, depending on the type and percentage of patients who received them. This study was carried out using a retrospective observation approach, in which data was retrieved from the patient's medical record.

2. METHOD

The study was carried out at one of the COVID-19 referral hospitals in Semarang City. This research was conducted using a cross-sectional approach. The

descriptive retrospective strategy was adopted. The idea is to figure out what kinds of antiviral drugs are used and how common they are. A total of 200 COVID-19 positive patients who were treated were evaluated retrospectively. Antiviral usage was classified according to gender, age, type, and prevalence. From March to August 2021, this study was conducted at the pharmaceutical installation of one of the COVID-19 referral hospitals in Semarang City. The first step in this study is to perform a survey at the hospital, which will be used as a research location. Second, get the study's permission, then get ethical clearance (EC) approval and decide on the inclusion criteria. Patients over the age of five years who were hospitalized with COVID-19 positive, released in healthy condition, had complete medical record data, and received antiviral medication met the study's inclusion criteria. Then it was on to data retrieval and processing. Finally, the researchers looked at the data. The Health Research Ethics Committee (KEPK) of Sekolah Tinggi Ilmu Farmasi Yayasan Pharmasi Semarang approved this study with the following number: 269/AHW-SW/KEPK/STIFAR/EC/2021.

3. RESULT AND DISCUSSION

3.1. Research Results

Researchers collected 105 medical records of COVID-19 patients getting hospital treatment from June to December 2020 after screening them based on inclusion criteria. COVID-19 instances are still at an all-time high in that month. Male patients with SARS-CoV-2 infection accounted for a higher percentage (67 percent) than female patients (33 percent).

Table 1 COVID-19 patients' characteristics and antiviral treatment

Characteristics	Variables	Total	Percentage (%)
Gender	Female	35	33.00
	Male	70	67.00
Age	0-5 years	0	0.00
	6-17 years	1	0.90
	18-50 years	49	47.00
	51-65 years	39	37.10
	>65 years	16	15.00
Antivirals	Oseltamivir	1	1.40
	Lopinavir/ritonavir	9	12.40
	Remdesivir	15	21.00
	Favipiravir	25	34.30
	Hydroxychloroquine + Oseltamivir	1	1.40
	Lopinavir/ritonavir + Favipiravir	2	2.90
	Remdesivir + Hydroxychloroquine	3	4.20
	Hydroxychloroquine + Lopinavir/ritonavir	7	10.00
	Favipiravir + Remdesivir	8	11.00
	Hydroxychloroquine + Oseltamivir + Lopinavir/ritonavir	1	1.40

3.2. Discussion

The results of the study in Table 1 showed that the prevalence of patients suffering from COVID-19 infection was highest in males (67.0 percent). Based on data on August 6, 2020, the number of men confirmed by COVID-19 in Indonesia is 52.1 percent, while 47.9 percent are female patients [19]. However, in some countries, men and women have almost the same number of cases. Patients who test positive for COVID-19 indicate that laboratory testing has been conducted. According to research Wulandari et al., men pay less attention and understand less about the prevention of COVID-19 disease than women. Since women are more likely to have more time to talk about or read about disease prevention, this is a good thing [20].

Males accounted for 51.5 percent of confirmed cases in June 2020, according to Decree of the Minister of Health of the Republic of Indonesia [21]. This is consistent with the Chinese CDC's conclusion that men account for 51.4 percent of confirmed cases. Similarly, in Italy, the majority of COVID-19 victims are men, with a rate of over 50% [22]. In Farghaly and Makboul study in Egypt, a total of 579 individuals were infected, with 311 patients (54.2 percent) having male sex [23]. Protection from sex hormones and the X chromosome, which play major roles in the adaptive and innate immune systems, can explain why women have fewer instances [24]. Men are more prone than women to contract illnesses caused by the SARS-CoV-2 virus, which is more severe and has a high fatality rate. Men also have a higher incidence of smoking and a higher risk of Chronic Obstructive Pulmonary Disease (COPD). Angiotensin Converting Enzyme-2 (ACE-2) expression rises in men and falls in women in general [25].

COVID-19 is an infection that can occur in children, adults, and the elderly. In this study, the majority of those suffering from the disease (47.0 percent) were between the ages of 18 and 50. In Indonesia, data as of August 6, 2020, the age group of 31-45 years (31.4 percent) describes the highest number of COVID-19 patients [19]. Some data shows that the most confirmed COVID-19 patients are between the ages of 18 and 87, with the majority of patients being male [26]. Guan et al.'s study, on the other hand, discovered that 41.9 percent of the population was female, with an average age of 47 years [27].

Based on Table 1, The results showed that the most widely used antiviral was favipiravir (34.30%) in a single administration, while the most commonly used combination was Favipiravir and Remdesivir (11.00%). It can be adjusted if remdesivir has good efficacy when used alone or in combination with other antiviruses. The findings of this investigation showed that remdesivir, in general, might help hospitalized COVID-19 patients improve their clinical outcomes. Favipiravir, either alone

or in conjunction with other supportive therapies, has been demonstrated to be a potential alternative for these patients' clinical recovery.

The researchers discovered that 12.40 percent of people used lopinavir or ritonavir only once. This is supported by Horby and Martin's research, which found no relation between lopinavir/ritonavir and lower mortality within 28 days. Furthermore, the duration of symptoms, gender, ethnicity, airway rescue, age, and estimated risk of death remained unchanged [28]. It also did not change the polymerase chain reaction (PCR) results from positive to negative in COVID-19 patients [29].

Favipiravir is a drug that was once approved for the treatment of influenza virus infection because it effectively inhibits the RNA-dependent RNA polymerase that is found in influenza, norovirus, and Ebola viruses. As a result of the active substance's ability to render SARS-CoV-2.4 inactive, the virus is unable to enter the cell because it is inhibited by RNA-dependent RNA Polymerase. As a result, the process of virus transcription and replication is disrupted [11], [12].

In this study, favipiravir was the most widely used antiviral, either single-handedly or in combination with other antiviral agents. The most common combination was remdesivir (11.0 percent), which was used alone 34.30 percent of the time. This is supported by several studies that reveal that favipiravir can improve the clinical conditions of COVID-19 patients. This agent can also be used in conjunction with supportive therapy in mild to moderate categories. In clinical trials of COVID-19, favipiravir showed faster clearance of the virus than lopinavir/ritonavir and better recovery rates than umifenovir. Overall, favipiravir has shown potential clinical trial results in several countries in the world, such as China, Russia, and Japan, as well as the United States, the United Kingdom, and India [30].

Antiviral medicines have been used in conjunction with or in comparison to hydroxychloroquine in various trials. This medication is a 4-aminoquinoline chemical that has long been used to treat malaria. This medicine has been regarded as a possible repurposed therapeutic option for treating COVID-19 patients due to its low cost and oral delivery. However, hydroxychloroquine alone has not been demonstrated to be effective in the treatment of COVID-19 individuals who are hospitalized. Furthermore, the FDA cancelled the permission for emergency hydroxychloroquine usage in COVID-19 patients in June 2020. In conclusion, the use of hydroxychloroquine alone in COVID-19 patients is not suggested due to its lack of effectiveness and possible hazards [31].

This research was very useful in obtaining information for pharmacists, especially those working in health services, especially in hospitals, in monitoring therapy and the effectiveness of antiviral usage so that

they could help improve the patient's condition. Our study's weaknesses, on the other hand, should not be overlooked. For starters, our study's sample size is small due to the brief duration of the research. Second, because this study is only descriptive, it has to be expanded into a prospective study to determine the direct impact of antivirals on patients' clinical conditions. Third, because all parameters that correlate with antiviral efficacy are uncontrollable, retrospective design bias is inescapable. Future studies with larger sample numbers and prospective designs to evaluate antiviral effectiveness, treatment outcomes, and patient quality of life are suggested.

4. CONCLUSION

Favipiravir is the most commonly prescribed antiviral, while Favipiravir and Remdesivir is the most commonly prescribed antiviral combination. The clinical condition, dose, and duration of the medicine are all changed for each patient. This study is very useful in getting information for pharmacists, especially those working in health services, mainly in hospitals, who are monitoring the therapy and efficacy of antiviral usage in order to assist patients in improving their condition.

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