http://ejournal.seaninstitute.or.id/index.php/healt
Jurnal eduhealth, Volume 14, No 01, 2023
E-ISSN. 2808-4608

Evaluation Of Rationality Of Antihypertension Drug Used at Pejagoan Community Health Center Period Of 2021

Rafila Intiyani[1], Nabila Rizki Romadani[2], Tri Cahyani Widiastuti[3]
[1,2,3]Pharmacy Undergraduate Program, Gombong Muhammadiyah University, Kebumen, Indonesia

ARTICLE INFO

ABSTRACT

The target population in this study were students of SMA Negeri 2 Bayang Pesisir Selatan who suffered from acne vulgaris on the facial skin. Data analysis using paired sample t test and independent t test. Result: most students are 17 years old 8 people (40%), the most gender are women as many as 18 people (90%), there is an effectiveness between the use of aloe vera facial wash and aloe vera gel with the degree of acne vulgaris in students at SMA Negeri 2 Bayang. (P = 0.000) and there is a effectiveness between the use of aloe vera facial wash and the degree of acne vulgaris in students at SMA Negeri 2 Bayang. (P=0.040). Conclusion: there is a difference in the effectiveness of the application of aloe vera facial wash and aloe vera gel between the degrees of acne vulgaris in students at SMA Negeri 2 Bayang. backgrounds, Hypertension or high blood pressure is a condition in which blood pressure increases to more than 140/90 mmHg. Based on the 2019 Kebumen District Health Profile, the total cases of hypertension patients at the Pejagoan Community Health Center in 2019 were 1,456 cases. There was an increase in the number of cases in 2020, which was 2,522 cases. The number of hypertension cases at Pejagoan Community Health Center is increasing every year, so the rational use of antihypertensive drugs is one of the most important things to achieve quality health. The purpose of the study, the purpose of this study was to determine the rationality of the accuracy of drug use based on the right drug, the right dose, the right indication, and the right time interval in hypertensive patients at the Pejagoan Community Health Center in 2021. This research is a non-experimental observational conducted with a descriptive method. The data collection method used retrospective data because the data was searched in the past from medical records using a random sampling technique. The results of the study, the results showed that the rationality of the use of antihypertensive drugs at the Pejagoan Health Center in 2021 was the right drug 77.8%, the right dose 100%, the indication 100% right, the time interval 97.8%. Based on the results of this study indicate that the use of antihypertensive drugs at the Pejagoan Community Health Center is still not rational, because in its use there are still inappropriate drugs (22.2%) and inappropriate time intervals (2.2%).

Keywords:
hypertension,
Antihypertensive Drugs,
Evaluation of Rationality

E-mail:
raila.291208@gmail.com

1. INTRODUCTION

Hypertension or high blood pressure is a condition where blood pressure increases until it reaches more than 140/90 mmHg. Data for 2011 World Health Organization (WHO)[22]. emphasized that there are 1 billion people in the world who experience hypertension, two thirds of them are in developing countries like Indonesia. The prevalence of hypertension will continue to increase sharply, it is predicted that by 2025, around 29% of adults worldwide suffer from hypertension. Hypertension has resulted in the death of around 8 million people each year, 1.5 million deaths occur in Southeast Asia, where one third of the population suffers from hypertension [9]. Based on the results of the 2018 Riskesdas, it shows that the prevalence of people in Central Java Province with hypertension is 37.57%. Prevalence in women (40, 17%) higher than men (34.83%). The prevalence will increase with age [3].

The silent disease is a nickname for hypertension, because this disease often occurs without any complaints, so sufferers do not know if they have hypertension. According to the 2013 Riskesdas and studies at the Puskesmas, less than a quarter of people with hypertension regularly seek treatment. This happens due to a lack of knowledge and understanding of patients regarding complications that can occur such as (congestive heart failure, chronic kidney failure, and stroke), treatment with limited funds, and minimal resource facilities at the Puskesmas, including the availability of antihypertensive drugs. 9].

Hypertension can be controlled by avoiding cigarette smoke, controlled diet, regular physical activity, reducing alcohol consumption, and drug therapy. Drugs are the main factor that supports health services. However, the World Health Organization (WHO) has predicted that there are approximately 50 percent of the preparation, prescription and sale of inappropriate drug use. Then the other 50 percent, the drug is used appropriately by the patient [11].

Drug use is said to be rational if the patient receives the drug according to his needs, for an adequate period of time and at the cheapest price for the patient and society. WHO estimates that more than half of all drugs in the world are prescribed, dispensed and sold in an inappropriate manner and half of patients use drugs correctly. The goal of rational drug use is to ensure that patients receive treatment according to their needs, for an adequate period of time at an affordable price [8].

Rational Drug Use (POR) has a policy that guarantees the effectiveness, affordable price and safety of a drug given to health care facilities for the community. Rational use of drugs is a form of quality health services. The main thing in the success of achieving the POR target is the commitment between the head of the puskesmas, the doctor as the prescriber, the pharmacy officer to give drugs rationally to patients [12].

The data obtained is based on the 2019 Kebumen District Health Profile, the total cases of hypertension patients at the Pejagoan Health Center in 2019 were 1,456 cases [3]. There was an increase in the number of cases of hypertension sufferers at the Pejagoan Health Center in 2020, namely 2,522 cases [3]. Based on the description of the data above, the researchers saw an increase in the number of cases of hypertension at the Pejagoan Health Center, so the researchers wanted to carry out research, namely evaluating the rationality of using antihypertensive drugs in terms of drug accuracy, right dosage, right indication, and right time interval at Pejagoan Health Center 2021 period

2. METHODS

This type of research is non-experimental observational research conducted using descriptive methods. Furthermore, the data that has been taken is then collected with a retrospective design. This research was conducted at the Pejagoan Health Center in Kebumen Regency in July 2022. The sample collection technique was to take a sample of hypertension patient's medication records using random sampling. The inclusion criteria for the sample in this study were treatment records of hypertensive patients for the 2021 period without comorbidities, patients aged 18-60 years with hypertension, patients receiving antihypertensive drugs, elderly patients, pregnant patients. The exclusion criteria were using illegible, incomplete and damaged patient treatment records. Based on the data that has been obtained, the number of medical records for hypertension patients at the Pejagoan Health Center in 2021 is 471 medical records. The data is then calculated using the Slovin formula which produces a number of 82.5 data, then rounded up to 90 medical record data. The data that has been collected is then arranged descriptively and presented in the form of a report using Microsoft Excel. Evaluation of the rationality of using antihypertensives was evaluated for suitability using the Pharmacotherapy Handbook ed 9 literature which included the right drug, the right dose, the right indication, and the right time interval. This research has obtained an ethnical from the Ethics Committee of the Muhammadiyah University of Gombong with Number: 231.6/II.3.AU/F/KEPK/VII/2022 5 data, then rounded up to 90 medical record data. The data that has been collected is then arranged descriptively and presented in the form of a report using Microsoft Excel. Evaluation of the rationality of using antihypertensives was evaluated for suitability using the Pharmacotherapy Handbook ed 9 literature which included the right drug, the right dose, the right indication, and the right time interval. This research has obtained an ethnical from the Ethics Committee of the Muhammadiyah University of Gombong with Number: 231.6/II.3.AU/F/KEPK/VII/2022 5 data, then rounded up to 90 medical record data. The data that has been collected is then arranged descriptively and presented in the form of a report using Microsoft Excel. Evaluation of the rationality of using antihypertensives was evaluated for suitability using the Pharmacotherapy Handbook ed 9 literature which included the right drug, the right dose, the right indication, and the right time interval. This research has obtained an ethnical from the Ethics Committee of the Muhammadiyah University of Gombong with Number: 231.6/II.3.AU/F/KEPK/VII/2022 right dose, right indication, and right time interval. This research has obtained an ethnical from the Ethics Committee of the Muhammadiyah University of Gombong with Number:

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3. RESULTS AND DISCUSSION

In this study, the data obtained on hypertensive patients during the 2021 period was 471 data. The data has been adjusted according to the inclusion and exclusion criteria. Then calculated using the Slovin formula which produces a total of 82.5 medical records, rounded up to 90 data. The characteristics of the patients taken are as follows:

Table 1. Characteristics of Gender

Gender	Case	Percentage
Woman	49	54.4%
Man	41	45.6%
Total	90	100.0%

Characteristics of patients based on sex there are 90 data sampled. Based on the table, it was found that most of the patients were female, namely 49 (54.4%) and male, 41 (45.6%). This shows that gender is a factor in the occurrence of hypertension. In general, the male sex is more at risk for experiencing increased blood pressure. This is presumably because men have a lifestyle that tends to increase blood pressure. In the male sex there are no hormones like those found in the female sex such as the hormone estrogen, so that men do not have protection against hypertension and its complications. The hormone estrogen itself is obtained by women when they experience menstruation every month and will continue to be updated.

Based on this, it shows that gender is related to hypertension. Research conducted by [15] also explains that both men and women have the possibility of developing hypertension with not too much difference. This is due to various possible factors, in men it is more towards lifestyle such as smoking habits, coffee consumption, stress, and uncontrolled eating. Whereas in elderly women due to the influence of menopause which results in changes in the hormone estrogen which functions to protect blood vessels from damage.

Table 2. Age Characteristics

Age	Case	Percentage
<45 years	12	13.3%
45-60 years	35	38.9%
>60 years	43	47.8%
Total	90	100.0%

Characteristics of patients based on sex there are 90 data sampled. The number of medical records from this age group can be seen in table 2. In this study, the age of the patients was categorized into 3 groups, where for adults <45 years, middle age 45-60 years, and elderly >60 years. Hypertension is a degenerative disease. Age greatly affects blood pressure, because with age, blood pressure will increase. In old age, systolic blood pressure increases a lot. This is due to natural factors at the age of 40 years when there are structural changes, especially in the large blood vessels [9].

In this study, the characteristics of patients based on age from a total of 90 medical record data, found 12 patients aged <45 years (13.3%), patients aged 45-60 years 35 (38.9%), and patients aged >60 years as many as 43 (47.8%). The results of this study are in line with research conducted by [1] which explains that the prevalence of hypertension with age >59 years is higher than those with hypertension aged <59 years.

According to Pharmaceutical Care, as we get older, sympathetic nerve activity also increases (sympathetic tone and/or diurnal variations), so that it is associated with an increased response to the stress of pricociosis. Old age can also cause an increase in renin secretion so that the production of angiotensin II and aldosterone also increases and can also cause an increase in peripheral plasma concentrations and the presence of glomerulosclerosis due to aging and intestinal fibrosis resulting in increased vasoconstriction and vascular resistance. As a result, blood pressure increases. [2].

Table 3. Therapeutic Variations

Therapy	**Case**	**Presentation**
Monotherapy	59	65.6%
Combination	31	34.4%
Total	90	100.0%

Variations in the use of antihypertensive drug therapy include 90 medical record data as samples. Based on table 3, there are variations of antihypertensive drug therapy prescribed to hypertensive patients at the Pejagoan Health Center, there are single therapy or monotherapy, and combinations. Of these, the therapy given to patients for monotherapy was 59 data (65.6%), while 31 data (34.4%) received a combination. In this study, the number of patients suffering from hypertension with blood pressure > 160/100 mmHg, the therapy given received more monotherapy treatment so that it was not in accordance with the Pharmacotherapy Handbook ed 9 guidelines. According to the literature guidelines, hypertension sufferers with blood pressure > 160/100 mm Hg should be given a combination of antihypertensives.

According to Pharmaceutical Care, hypertensive patients with blood pressure > 160/100 mmHg are less effective if only given single drug therapy, because they do not reach the target of therapy. The addition of a second drug from a different class begins if the use of a single drug with a usual dose fails to reach the target blood pressure. As with hypertension with blood pressure> 140/90 mmHg, just give manotherapy. Because, if a combination therapy is given, it can cause unwanted side effects such as hypotension or toxicity effects [2].

According to the American Heart Association 2017, hypertensive patients with blood pressure > 160/100 mmHg are given non-pharmacological therapy and drugs by considering two antihypertensive drugs from different classes. Hypertensive patients with blood pressure >160/100 mmHg should be treated and monitored properly. WHO recommends pharmacological treatment using first-line therapeutic agents, namely thiazide diuretics, calcium channel blockers (CCB), ACEI inhibitors, or angiotensin receptor blockers (ARB) [22].

Table 4. Drug Class

Drug Class	**Frequency**	**Presentation**
CCB	59	66.5%
CCB+ACEI	16	17.8%
CCB+ARB	8	8.9%
CCB + Diuretic	7	7.8%
Total	90	100.0%

There are 90 samples of antihypertensive drugs in the Pejagoan Health Center. Based on data on antihypertensive drug classes in table 4, it was found that hypertensive patients at the Pejagoan Health Center in 2021 with a total of 90 medical records, used the most drugs from the calcium channel blocker (CCB) class, namely amlodipine with 59 medical records (66.5%)). CCB+ACEI as many as 16 medical records (17.8%). CCB + ARB as many as 8 medical records (8.9%). CCB + Diuretics in 7 medical records (7.8%).

The results of this study are in line with research conducted by (Herawati et al., 2021) at Dr. H Bob Bazar, SKM South Lampung who explained that CCB antihypertensive drugs were the most widely administered antihypertensive drugs, especially amlodipine, with a percentage of a total of 51 patients, there were 7 (13.72%) patients. In the Pharmacotherapy Handbook ed 9 literature it is explained that CCBs are a class of first-line drugs for hypertension. The CCB drug class has been shown to be safe and effective in reducing blood pressure with good tolerance in the clinical management of hypertension in monotherapy or in combination [21].

The way CCB drugs work is by inhibiting the influx of calcium along the cell membrane. There are two types of voltage gated calcium channels: high voltage channels (type L) and low voltage channels (type T). The CCBs that are present only block L-type channels, leading to coronary and peripheral vasodilation. There are two subclasses of CCBs, dihydropyridines and nondihydropyridines. Both are very different from each other. The antihypertensive effectiveness is almost the same, but there are differences in other pharmacodynamic effects. CCB is very effective in the elderly with isolated systolic [2].

Table 5. Types of Drugs

Drug Type	Frequency	Percentage
amlodipine	59	65.6%
Amlodipine + Captropil	16	17.8%
Amlodipine + Candesartan	8	8.9%
Amlodipine + Furosemide	4	4.4%
Amlodipine + HCT	3	3.3%
Total	90	100.0%

Based on table 5 regarding the types of antihypertensive drugs at the Pejagoan Health Center with data of 90 medical records. The most widely used type of drug was amlodipine with 59 data (65.6%). Meanwhile, the lowest/rarely used type of drug therapy was the combination of amlodipine+HCT with 3 data (3.3%). The number of patients receiving monotherapy or single therapy at the Pejagoan Health Center in 2021 (see table 5), so that the most commonly prescribed antihypertensive is amlodipine.

These results are in line with previous research conducted by (Sodiqoh et al., 2021) regarding the rationality of using antihypertensive drugs at the Bumiayu Health Center in 2021 with the result that most hypertensive patients at the Bumiayu Health Center used the type of drug Amlodipine with a percentage of 89.8%. The drug amlodipine is a class of first-line drugs that can reduce blood pressure [21].

In the table, for combination therapy the use of amlodipine and captropil is the most widely used with a percentage of 17.8%. This combination is the right combination because both come from different drug classes. The different classes of drugs are effective so that they both work with different mechanisms in lowering blood pressure. Sustained drug use is based on consistent evidence of its ability to reduce the risk of heart disease, stroke and even death [14].

Table 6. Evaluation of the Rationality of Appropriate Medicines

Results	Frequency	Percentage
Right Medicine	70	77.8%
Inappropriate Medication	20	22.2%
Total	90	100.0%

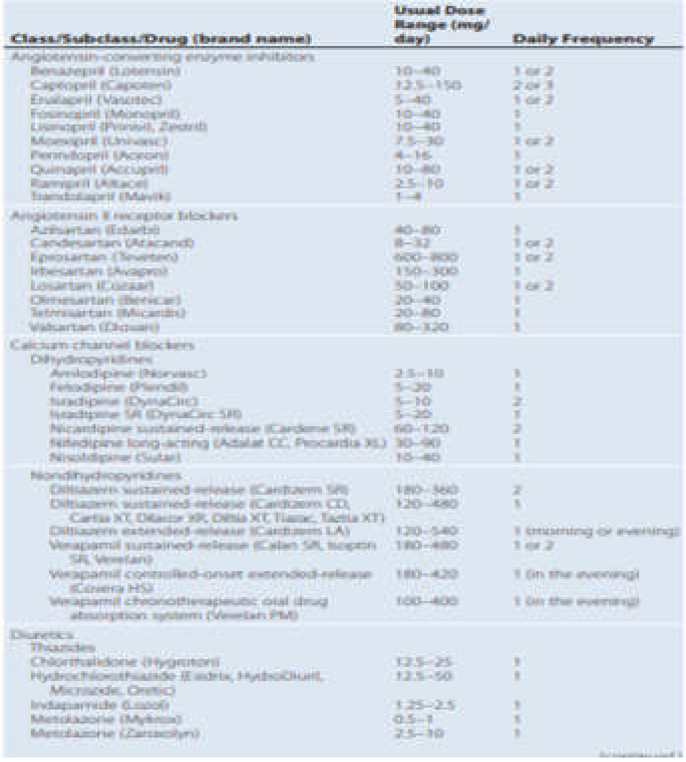
Based on table 6. Regarding the evaluation of rationality based on the right drug with 90 medical record data. The results obtained were 70 patients (77.8%) given antihypertensive drugs according to the Pharmacotherapy Handbook and 20 patients (22.2%) were given inappropriate antihypertensive drugs. This drug incompatibility was caused by inappropriate administration of antihypertensive drugs where there were 20 hypertensive patients consisting of 17 hypertensive patients with blood pressure >160/100 mmHg who were given single drug therapy and 3 hypertensive patients with blood pressure >140/90 mmHg who were given combination therapy. .

Evaluation of the accuracy in this study was seen and compared with the Pharmacotherapy Handbook ed 9 literature based on the drugs prescribed to patients. According to the Pharmacotherapy Handbook ed. 9 literature, for hypertension with blood pressure > 140/90 mmHg, it is sufficient to be given a single drug class or monotherapy. Most patients with blood pressure >140/90 mmHg are given first-line antihypertensives, for example, ACE, ARB, CCB and thiazide diuretic classes. For hypertension with blood pressure> 160/100 mmHg given a combination of antihypertensives. The combination therapy recommendations include using two first-line agents.

Table 7. Rationality Evaluation of Dosage Accuracy

Results	Frequency	Percentage
Correct Dosage	90	100.0%
Incorrect Dosage	0	0.0%
Total	90	100.0%

Based on table 7. Regarding the evaluation of rationality for the right dose with 90 medical record data, the results for the correct dose were 90 patients (100%) with the right dose. The dosage accuracy in this study has been adjusted according to the Pharmacotherapy Handbook ed 9 guidelines. The appropriate dosage in the literature can be seen in the following figure:



Class/Subclass/Drug (brand name)	Usual Dose Range (mg/day)	Daily Frequency
Angiotensin-converting enzyme inhibitors		
Benazepril (Lotensin)	10–40	1 or 2
Captopril (Capoten)	12.5–150	2 or 3
Enalapril (Vasotec)	5–40	1 or 2
Fosinopril (Monopril)	10–40	1
Lisinopril (Prinivil, Zestril)	10–40	1
Moexipril (Univasc)	7.5–30	1 or 2
Perindopril (Aceon)	4–16	1
Quinapril (Accupril)	10–80	1 or 2
Ramipril (Altace)	2.5–10	1 or 2
Trandolapril (Mavik)	1–4	1
Angiotensin II receptor blockers		
Azilsartan (Edarbi)	40–80	1
Candesartan (Atacand)	8–32	1 or 2
Eprosartan (Teveten)	600–800	1 or 2
Irbesartan (Avapro)	150–300	1
Losartan (Cozaar)	50–100	1 or 2
Olmesartan (Benicar)	20–40	1
Telmisartan (Micardis)	20–80	1
Valsartan (Diovan)	80–320	1
Calcium channel blockers		
Dihydropyridines		
Amlodipine (Norvasc)	2.5–10	1
Felodipine (Plendil)	5–20	1
Isradipine (DynaCirc)	5–10	2
Isradipine SR (DynaCirc SR)	5–20	1
Nicardipine sustained-release (Cardene SR)	60–120	2
Nifedipine long-acting (Adalat CC, Procardia XL)	30–90	1
Nisoldipine (Sular)	10–40	1
Nondihydropyridines		
Diltiazem sustained-release (Cardizem SR)	180–360	2
Diltiazem sustained-release (Cardizem CD, Cartia XT, Dilacor XR, Diltia XT, Tiazac, Taztia XT)	120–480	1
Diltiazem extended-release (Cardizem LA)	120–540	1 (morning or evening)
Verapamil sustained-release (Calan SR, Isoptin SR, Verelan)	180–480	1 or 2
Verapamil controlled-onset extended-release (Covera HS)	180–420	1 (in the evening)
Verapamil chronotherapeutic oral drug absorption system (Verelan PM)	100–400	1 (in the evening)
Diuretics		
Thiazides		
Chlorthalidone (Hygroton)	12.5–25	1
Hydrochlorothiazide (Esidrix, HydroDiuril, Microzide, Oretic)	12.5–50	1
Indapamide (Lozol)	1.25–2.5	1
Metolazone (Mykrox)	0.5–1	1
Metolazone (Zaroxolyn)	2.5–10	1

(continued)

Figure 1. Appropriate Dosage

These results were reinforced by a previous study conducted by [21] which showed that out of a total of 78 patients, (100%) had the right dose. The right dose is the suitability of the dosage of antihypertensive drugs with the range of therapeutic doses, in terms of the dose used per day which is based on the patient's special condition. If the treatment of antihypertensive drugs is within the minimum dose range and the recommended daily dose, then the treatment is said to be the right dose. It is said that the dose is too low or the dose is too low, that is, if the dose is below the range of therapeutic doses that the patient should receive. A dose that is too low can cause blood levels of the drug to fall below the therapeutic range so that the expected response cannot be achieved. On the contrary,

Table 8. Evaluation of the Rationality of the Accuracy of Indications

Results	Frequency	Percentage
Precise Indication	90	100.0%
Improper Indication	0	0.0%
Total	90	100.0%

Based on table 8. Evaluation of rationality with 90 medical record data of hypertensive patients obtained the results of an indication accuracy of 100% correct indication. These results are in accordance with research conducted previously by Neni Herawati and friends that from 51 medical record data the results (100%) were correct indications. Accuracy of indications, namely the suitability of drug administration between indications and diagnoses made by doctors. Drug selection can refer to the diagnosis. If the diagnosis is not appropriate, then the drugs used will not have the desired effect [21]. This is in line with the accuracy in drug selection based on the Pharmacotherapy Handbook ed 9 literature guidelines.

Based on research conducted by Untari and friends, explaining the same thing that hypertension patients at the Siantan Hilir Pontianak Health Center during the period January - December 2015 met the right indication criteria of 100%. This is due to antihypertensive prescribing following the availability of drugs at the Puskesmas. It can be seen that all of the Puskesmas have indications for hypertension, therefore the accuracy of the indication is 100% [19].

Table 9. Rationality Evaluation of Time Interval Accuracy

Results	**Frequency**	**Percentage**
Exact Time Interval	88	97.8%
Not exactly Time Intervals	2	2.2%
Total	90	100.0%

Based on table 9, it is known that the evaluation of rationality based on the right time interval with 90 medical record data of hypertensive patients at the Pejagoan Health Center obtained the correct time interval results of 88 (97.8%) of the antihypertensive treatment given was in accordance with the Pharmacotherapy Handbook guidelines, and as many as 2 (2) ,2%) is not appropriate. This discrepancy was due to the administration of captropil 12.5 mg 1x1 and the administration of captropil 25 mg 1x1. According to the literature guidelines Pharmacotherapy Handbook ed 9, administration of 12.5 mg of captropil or 25 mg of captropil is 2x or 3x a day. Evaluation of the accuracy of the time interval is said to be correct if the drug administration at the time interval between drug consumption is in accordance with the half-life of the drug in the blood

Inappropriate use rules indicate that the treatment therapy is also inappropriate. In this case, it means that the daily dose once a day is too low from the rules of use that the patient should receive. Dosage greatly affects the effect of drug therapy. The use of excessive doses in the use of drugs with a narrow therapeutic range, the risk of side effects. Conversely, a dose that is too low can cause blood levels of the drug to fall below the therapeutic range so that the expected response cannot be achieved [8].

4. CONCLUSION

Based on research that has been conducted at the Pejagoan Health Center, it can be concluded that the results of the evaluation of rationality for the accuracy of drug use, based on the right criteria for the drug, namely 77.8%, based on the criteria for the right dose of 100%, based on the criteria for the right indication of 100%, and based on the criteria exact time interval of 97.8%.

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