B-ICON Proceeding

DESCRIPTION OF BLOOD CLOTTING TIME IN HYPERTENSIVE PATIENTS USING THE SLIDE METHOD IN THE WORKING AREA OF THE KUALA LEMPUING COMMUNITY HEALTH CENTER, BENGKULU CITY

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Abstract

Hypertension is one of the major global health problems, often referred to as a *silent killer* because it typically presents without symptoms but can lead to serious complications, including coagulation disorders. One of the key parameters for assessing coagulation function is clotting time. Uncontrolled hypertension can cause endothelial damage, which accelerates the activation of the coagulation pathway. This study aims to describe the clotting time in hypertensive patients using the slide method in the working area of UPTD Puskesmas Kuala Lempuing, Bengkulu City, in 2025. This research employed a descriptive design with a quantitative approach. A total of 31 respondents were selected using accidental sampling from a population of 100 hypertensive patients. Data were collected through direct measurement of blood pressure and capillary clotting time using the slide method. The data were analyzed univariately.The average age of respondents was 51.8 years, ranging from 35 to 74 years. Nearly all respondents were female (97%). The majority had mild hypertension (68%), nearly a quarter had moderate hypertension (26%), and a small proportion had severe hypertension (6%). The average clotting time was 2 minutes, with a minimum of 1 minute and a maximum of 4 minutes and 30 seconds. The average blood clotting time in individuals with hypertension falls within the lower limit of the normal range, with some respondents experiencing shortened clotting time and a small proportion suffering from severe hypertension. Therefore, regular monitoring of coagulation function is recommended as part of hypertension management.

Keywords: clotting time, hypertension, blood, detection

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INTRODUCTION

Hypertension, or high blood pressure, is a very common medical condition among the general population, including in Indonesia (Ekasari, 2021). This condition not only increases the risk of various cardiovascular diseases, but can also affect various physiological aspects of the body, including the blood clotting process (Tolla et al., 2019). Hypertension is often referred to as the “silent killer” because it often does not show obvious symptoms. If not treated properly, it can cause long-term damage to organs and even death (WHO, 2023). A person can be diagnosed with hypertension if their systolic blood pressure is ≥140 mmHg and their diastolic blood pressure is ≥90 mmHg in a single visit (Tolla et al., 2019).

According to the World Health Organization, hypertension is a major global health problem affecting around 1 billion people and contributing to over 10 million deaths each year, with a worldwide prevalence of about 22%Southeast Asia ranks third in terms of hypertension prevalence at 25% of the total population (WHO, 2023). Based on the 2018 Riskesdas, the prevalence of hypertension based on measurements in people aged ≥18 years was 34.1%, highest in South Kalimantan at 44.1%, while the lowest was in Papua at 22.2%. The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the number of deaths in Indonesia due to hypertension is 427,218 deaths (Riskesdas, 2018). This condition increases the risk of excessive thrombus formation. The surface of blood vessels becomes stickier, making it easier for platelets to stick together and form clots that cause blood to clot more quickly (Santos, 2022). In addition, hypertension is associated with increased coagulation activity, which plays a role in the development of thromboembolic complications (Tolla et al., 2019). One parameter that can be used to check the blood clotting process is clotting time (Arthur C. Guyton, J. E. H, 2020). Clotting time measures the length of time it takes for blood to clot after injury or inflammation occurs in the body (Apriani, 2021).

Research conducted by Rafaqat et al. (2023) shows an increase in D-dimer levels in individuals with hypertension compared to healthy controls, and that D-dimer levels increase with the severity of hypertension, indicating increased fibrin coagulation activity. These findings reinforce the hypothesis that hypertension increases the risk of thromboembolism through excessive blood clotting. According to data from the Bengkulu City Health Office in 2023, there were 6,155 people with hypertension in Bengkulu City. Based on the results of a survey of hypertension cases at the Kuala Lempuing Community Health Center, there were 100 cases of hypertension in the last two months (September-October 2024). Based on the above description, it is important to conduct further research on the description of blood clotting time in patients with hypertension.

MATERIALS AND METHODS

This type of research is descriptive in which the author observes the blood clotting time of hypertensive patients in the working area of the Kuala Lempuing Community Health Center in Bengkulu City in 2025. The study was conducted on respondents with hypertension who were undergoing outpatient treatment in the working area of the Kuala Lempuing Community Health Center in Bengkulu City. The tools used in the examination were a stopwatch, autoclave lancet, sterile lancet, sphygmomanometer, 70% alcohol swab, and glass/slide. The research population consisted of all hypertensive patients in the Kuala Lempuing Community Health Center, Bengkulu City, totaling 100 people.

The sample (respondents) in this study was determined using accidental sampling, which is a technique of determining samples taken at a certain place by chance at a certain time. The number of respondents was

31 people. The examination was conducted by first measuring blood pressure to determine the status of hypertension (mild, moderate, or severe), followed by measuring blood clotting time with the examination location at the fingertip or capillary blood vessels. Blood clotting time is examined using the slide methodby first disinfecting the patient's fingertip with a 70% alcohol swab.

After that, the patient's fingertip is pricked with an autoclave lancet to a depth of 3 mm until blood comes out. The first drop of blood is wiped away, then the next two drops of blood are dripped onto the object glass, and the stopwatch is immediately started. Next, the blood droplets are lifted using a needle every 30 seconds until fibrin threads appear as a sign of blood clotting. Then the time on the stopwatch is recorded as the result of the blood clotting time test. This study was conducted at the Kuala Lempuing Community Health Center in Bengkulu City for three days, with 12 people participating on the first day, 11 people on the second day, and 8 people on the third day.

RESULTS AND DISCUSSION

The results of research conducted on patients with hypertension at the Kuala Lempuing Community Health Center in Bengkulu City are shown in the following table:

Table 1. Average age of respondents Hypertension UPTD Community Health CenterKuala Lempuing Bengkulu City (Year)

Mean	Median	Modus	Min	Max	SD
51.8	52	54	35	70	8.52

Based on Table 1, it can be seen that the mean (average) age of respondents with hypertension is 51.8, while the median is 52, the Mode (most frequent value) is 54, the Min value (lowest value) is 35, the Max value (highest value) is 80, and the SD value (standard deviation) is 8.52.

Table 2. Frequency distribution of respondents' gender in the working area of the Kuala Lempuing Community Health Center Technical Implementation Unit, Bengkulu City, 2025

Gender	Frequency	Percentage
Women	30	97
Men	1	3
Total	53	100

Based on Table 2, it can be seen that almost all (97%) respondents were female and a small portion (3%) were male.

Table 3 Frequency distribution of hypertension status among respondents at the Kuala Lempuing Community Health Center, Bengkulu City, in 2025.

Status Hypertension	Frequency	Percentage
Light	21	68
Medium	8	26
Heavy	2	6
Total	31	100

Based on the table 3 It was found that most (68%) respondents had mild hypertension, almost all respondents had moderate hypertension (26%), and a small number (6%) of respondents had severe hypertension.

Table 4 Average blood clotting time among respondents at the Kuala Lempuing Community Health Center, Bengkulu City, in 2025.

Mean (Menit)	Median	Modus	Min Max (Menit)		SD
02.00	02.00	02.00	01.00	04.30	46

Based on Table 4 Based on Table 4.1, it can be seen that the mean (average) blood clotting time in respondents was 2 minutes, while the median (middle value) blood clotting time was 2 minutes. The mode (most frequently occurring value) is 2 minutes, the minimum value is 1 minute, the maximum value is 4 minutes 30 seconds, and the standard deviation is 0.46 minutes.

The study was conducted to determine the blood clotting time profile of hypertensive patients at the Kuala Lempuing Community Health Center in Bengkulu City in 2025. Based on the results of the study conducted on 31 hypertensive respondents at the Kuala Lempuing Community Health Center in Bengkulu City, various findings relevant to the research objectives were obtained.

The age distribution of respondents showed that the average age was 51.8 years, with an age range of 35 to 74 years. From these results, it can be stated that the majority of respondents were middle-aged to elderly. This is in line with findings from the World Health Organization (2021) and the Indonesian Ministry of Health (2023), which state that the risk of hypertension increases with age due to decreased blood vessel elasticity and increased peripheral resistance. Aging causes structural changes in the cardiovascular system that also affect the hemostasis process and Blood clotting time (Arthur C. Guyton, 2020).

Based on gender distribution, almost all (97%) respondents in this study were female, while a small proportion (3%) were male. This imbalance was due to exclusion criteria that did not include active

smokers, while most men with hypertension in the study location were smokers. Srivastava's (2024) study showed that smoking can prolong blood clotting time through the mechanism of chronic endothelial damage. In addition, evidence from previous studies states that postmenopausal women experience an increased risk of hypertension due to a decrease in the hormone estrogen, which plays a role in regulating vascular balance and coagulation (Santosa, 2022). These hormonal changes can also accelerate the activation of the coagulation system, thereby affecting blood clotting time (Srivastava, 2024; Santosa, 2022).

Based on the classification of hypertension, most (68%) respondents had mild hypertension, nearly half (26%) had moderate hypertension, and a small proportion (6%) had severe hypertension. Thus, most respondents had mild hypertension, nearly half had moderate hypertension, and a small proportion had severe hypertension. These findings are in line with Zhang's (2023) study, which reported that changes in the coagulation system, such as increased fibrinogen and platelet levels, as well as decreased prothrombin and APTT times, occur from the early stages of hypertension. This indicates that coagulation changes can occur before hypertension reaches an advanced stage (Zhang, 2023). Blood clotting time measurements showed an average value of 2 minutes, with a minimum value of 1 minute and a maximum value of 4 minutes 30 seconds. These values indicate that clotting time is at the lower limit or faster than the normal range of the slide method, which is 2–6 minutes. Thus, the majority of respondents experienced shortening.

Blood clotting time. Based on evidence from previous studies, shortening of blood clotting time in hypertensive patients is associated with excessive activation of the coagulation system. Chronic hypertension can cause stress on the vascular endothelium, triggering the release of tissue factors and activation of the extrinsic coagulation pathway, as well as increased platelet activity (Wilson, 2021; Santosa, 2022).

Interestingly, shortened blood clotting time was more commonly found in respondents with mild hypertension. This phenomenon is thought to occur because in the early stages of hypertension, treatment may not yet be optimal, so the hypercoagulation process is still active. The dosage of medication used at this stage is usually lower than in severe hypertension. Santos' (2022) research confirms that a prothrombotic condition can appear earlier before target organ complications develop, with increased levels of clotting factors such as fibrinogen and thromboplastin, which accelerates blood coagulation (Santos, 2022).

Conversey, some patients with severe hypertension show blood clotting times that are within the normal range. This is thought to be due to the regular use of antihypertensive drugs, particularly amlodipine. According to Zhang's (2023) research, amlodipine, as a calcium channel blocker, not only lowers blood

pressure but also improves endothelial function and reduces inflammatory responses, thereby decreasing the risk of excessive coagulation activation (Zhang, 2023). Thus, this study indicates that blood clotting time can shorten even though blood pressure is mild and clinical conditions appear stable. Therefore, it is crucial for healthcare professionals to routinely monitor coagulation in addition to measuring blood pressure to prevent complications such as thrombosis (Wilson, 2021; Santosa, 2022).

CONCLUSION

Based on the results of the study, it was concluded that the average age of respondents with hypertension was 51.8 years with an average blood clotting time of 2 minutes. Almost all respondents (97%) were female, and a small proportion (6%) of respondents had severe hypertension.

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DECLARATION OF INTEREST STATEMENT

The authors declare that they have no conflict of interests.

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