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Research Article

RELATIONSHIP BETWEEN BLOOD PRESSURE VALUES AND HIGH-DENSITY LIPOPROTEIN (HDL) LEVELS IN HYPERTENSIVE PATIENTS AR BALARAJA HOSPITAL

Novia Nur Andini[1] ✉, Nining Kurniati[2], Dr. dr. Raden Adjeng Dewi Maria Yuliani[3], Nadia Guntari[4], Priscila Santos[5]

[1,2,3,4]Department of Medical Laboratory Technology, The Polytechnic of Health of Banten, Tangerang Indonesia
[5]Instituto de Física, Universidade de São Paulo, São Paulo, Brazil

KEYWORDS

Blood pressure
HDL levels
Hypertension

ABSTRACT

Blood pressure and high-density lipoprotein (HDL) levels are two key indicators used to assess cardiovascular health, both of which play important roles in the risk of heart disease and stroke. High blood pressure, including both systolic and diastolic pressure, is a major risk factor for various cardiovascular diseases. Meanwhile, HDL is often referred to as "good cholesterol" because of its role in transporting cholesterol from the arteries to the liver, where it can be eliminated from the body. This study aimed to determine the relationship between blood pressure and HDL levels in hypertensive patients at Balaraja Hospital. A cross-sectional design was used, with a sample of 19 patients who met the inclusion criteria. HDL levels were measured using the Cholesterol Oxidase Para Amino Phenazone (CHOD-PAP) method. The results of the normality test showed p-values of 0.101 for HDL levels, 0.006 for systolic blood pressure, and 0.018 for diastolic blood pressure. These results indicate that HDL levels were normally distributed, whereas systolic and diastolic blood pressure were not. Therefore, a Spearman rank correlation test was used for further analysis. The results of the Spearman correlation test showed a p-value of 0.062 for systolic blood pressure and 0.190 for diastolic blood pressure, indicating no significant relationship between HDL levels and blood pressure. The correlation coefficients showed a very weak relationship for both systolic (r = 0.010) and diastolic blood pressure (r = 0.190) In conclusion, there was no significant relationship between blood pressure and HDL levels in hypertensive patients at Balaraja Hospital.

Kata Kunci

Tekanan darah
Kadar HDL
Hipertensi

ABSTRAK

Tekanan darah dan kadar high-density lipoprotein (HDL) merupakan dua indikator utama yang digunakan dalam penilaian kesehatan kardiovaskular. Keduanya berperan penting dalam risiko terjadinya penyakit jantung dan stroke. Tekanan darah tinggi, baik sistolik maupun diastolik, merupakan faktor risiko utama berbagai penyakit kardiovaskular. Sementara itu, kadar HDL sering dianggap sebagai "kolesterol baik" karena kemampuannya mengangkut kolesterol dari arteri ke hati untuk kemudian dikeluarkan dari tubuh. Penelitian ini bertujuan untuk mengetahui hubungan antara nilai tekanan darah dan kadar high-density lipoprotein pada pasien hipertensi di RSUD Balaraja. Penelitian ini menggunakan desain cross-sectional. Sampel penelitian terdiri dari 19 pasien yang memenuhi kriteria inklusi. Metode pemeriksaan yang digunakan adalah Cholesterol Oxidase Para Amino Penazon (CHOD-PAP). Hasil uji normalitas menunjukkan nilai p = 0,101 untuk kadar HDL, p = 0,006 untuk tekanan darah sistolik, dan p = 0,018 untuk tekanan darah diastolik, yang menunjukkan bahwa kadar HDL berdistribusi normal, sedangkan tekanan darah tidak berdistribusi normal. Oleh karena itu, analisis selanjutnya menggunakan uji korelasi. Hasil uji korelasi Spearman rank menunjukkan nilai signifikansi p = 0,062 untuk tekanan darah sistolik dan p = 0,190 untuk tekanan darah diastolik, yang menunjukkan tidak terdapat hubungan yang signifikan antara kadar HDL dan tekanan darah, dengan kekuatan korelasi yang sangat lemah baik pada tekanan darah sistolik (r = 0,010) maupun diastolik (r = 0,190). Kesimpulan dari penelitian ini adalah tidak terdapat hubungan yang signifikan antara tekanan darah dan kadar HDL pada pasien hipertensi di RSUD Balaraja.

✉ ***Corresponding Author:***

Novia Nur Andini
Department of Medical Laboratory Technology, The Polytechnic of Health of Banten, Tangerang Indonesia
novianurandini.04@gmail.com

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INTRODUCTION

Hypertension is a global health problem whose prevalence continues to increase each year. The World Health Organization (WHO) states that a person is considered hypertensive when systolic blood pressure is ≥140 mmHg and/or diastolic blood pressure is ≥90 mmHg. Hypertension is a major risk factor for cardiovascular diseases such as stroke, heart failure, and coronary heart disease, all of which contribute to high mortality rates in many countries, including Indonesia. Based on data from the Riset Kesehatan Dasar (Riskesdas) 2018, the prevalence of hypertension in Indonesia reached 34.1%, with a higher rate observed in women than in men (Kalma et al., 2021).

One of the factors contributing to hypertension is an abnormal blood lipid profile, or dyslipidemia, particularly low levels of high-density lipoprotein (HDL). HDL is known as "good cholesterol" because it functions to transport cholesterol from peripheral tissues back to the liver for elimination. Low HDL levels have been associated with an increased risk of atherosclerosis and narrowing of blood vessels, which may eventually lead to increased blood pressure. Therefore, optimal HDL levels are essential for maintaining cardiovascular health, especially in patients with hypertension (Kurniasih, 2024).

Based on this background, this study was conducted to determine whether there is a relationship between blood pressure and HDL levels in hypertensive patients at Balaraja Hospital. By identifying this relationship, the findings are expected to provide a basis for interventions aimed at preventing complications of hypertension and to offer additional information for the management of patients at high cardiovascular risk.

MATERIALS AND METHODS

Instruments, Materials, and Samples

This study employed a quantitative approach with a cross-sectional design. The population consisted of female hypertensive patients at Balaraja Hospital, with a total of 19 participants selected using purposive sampling.

HDL levels were measured using the Cholesterol Oxidase Para Amino Phenazone (CHOD-PAP) method. Data normality was assessed using the Kolmogorov–Smirnov test. Since the data were not normally distributed, the relationship between blood pressure and HDL levels was analyzed using Spearman rank correlation.

Ethical approval for this study was obtained from the relevant institutional review board.

RESULT AND DISCUSSION

Table 1. Distribution of Hypertensive Patients

Patient Characteristics	n	%
Age (years)		
18-24	0	0%
25-34	2	10.53%
35-44	6	31.58%
45-54	11	57.89%
55-64	0	0%
Hypertension		
Grade 1	5	26.32%
Grade 2	14	73.68%
Total	**19**	**100%**

Based on Table 1, the highest proportion of patients was in the 45–54 years age group (57.89%), followed by the 35–44 years group (31.58%) and the 25–34 years group (10.53%). The majority of patients had grade 2 hypertension (73.68%). Grade 1 hypertension is defined as blood pressure ranging from 140–159 mmHg, whereas grade 2 hypertension is defined as blood pressure ≥160 mmHg.

Table 2. Distribution of Hypertensive Patients by HDL Levels

HDL Level (mg/dL)	n	%
<=40	1	5.26
>=40	18	94.74
Total	**19**	**100**

Based on Table 2, the distribution of hypertensive patients according to high-density lipoprotein (HDL) levels showed that the highest proportion was in the ≥40 mg/dL category (94.74%).

Table 3. Distribution of Sample HDL Levels by Hypertension Grade

HDL Level	Grade 1 (120-80)	%	Grade 2 (140-90)	%
	n		n	
<=40	10	83.33	5	71.43
>=40	2	16.77	2	28.57
Total	**12**	**100**	**7**	**100**

Based on Table 3, the distribution of high-density lipoprotein (HDL) levels by hypertension grade showed notable proportions in both categories, with HDL levels ≤40 mg/dL accounting for 83.33% in grade 1 hypertension and 71.43% in grade 2 hypertension.

Table 4. Results of the Normality Test and Correlation Test

Variable	Kolmogorov-Smirnov	Spearman Rank	Spearman Rank
	p	r	p
High-density lipoprotein level	0.101	-	-
Systolic blood pressure	0.006	0.062	0.800
Diastolic blood pressure	0.018	0.190	0.072

Based on Table 4, the normality test yielded p-values of 0.101 for HDL levels, 0.006 for systolic blood pressure, and 0.018 for diastolic blood pressure. These results indicate that HDL levels were normally distributed, whereas systolic and diastolic blood pressure were not. Therefore, Spearman rank correlation was used for further analysis.

The Spearman correlation test showed p-values of 0.800 for systolic blood pressure and 0.072 for diastolic blood pressure, indicating no significant relationship between HDL levels and blood pressure. The correlation coefficients demonstrated a very weak association for both systolic (r = 0.062) and diastolic blood pressure (r = 0.190).

Most respondents belonged to an age group at risk for hypertension, namely 45–54 years, a period during which hormonal changes may be associated with decreased HDL levels. Nevertheless, the majority of respondents still had HDL levels within the normal range.

The findings of this study showed no significant relationship between blood pressure and HDL levels. Other factors, such as lifestyle, diet, physical activity, and medication use, may play a more dominant role in influencing blood pressure. This result is consistent with studies by Andini et al. (2013) and Mandala et al. (2016), which also reported no significant relationship between HDL levels and blood pressure.
However, these findings differ from those of Rafsanjani et al. (2021) and Feryadi (2012), who reported a significant negative relationship between HDL levels and blood pressure, particularly among men or individuals of productive age.

CONCLUSION

There was no significant relationship between blood pressure, whether systolic or diastolic, and HDL levels in hypertensive patients at Balaraja Hospital. HDL levels are not the sole factor influencing blood pressure.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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