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Cardiovascular Risk Factors in Hypertension, Dyslipidemia, and Arterial Hypotension: A Clinical Overview

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Abstract: Cardiovascular diseases (CVD) continue to be a leading cause of morbidity and mortality worldwide. Early identification of modifiable and non-modifiable risk factors is crucial for the effective prevention of cardiovascular complications. This article synthesizes findings from three studies: assessment of cardiovascular risk factors in patients with hypertension and cerebral circulatory disorders, evaluation of the prevalence of arterial hypertension among patients with combined dyslipidemia, and investigation of the relationship between peripheral blood flow and autonomic nervous system activity in young women with idiopathic arterial hypotension. The combined analysis highlights the significance of early risk detection, comorbidity management, and individualized therapeutic approaches to improve patient outcomes and reduce the burden of cardiovascular disease.

Keywords: Hypertension, Dyslipidemia, Combined Dyslipidemia, Arterial Hypotension, Cardiovascular Risk Factors, Autonomic Nervous System

1. Introduction

Cardiovascular diseases (CVD) are among the leading causes of morbidity and mortality worldwide. They are developed with an effect of modifiable risk factors, including hypertension, dyslipidemia, obesity, diabetes, and smoking and non-modifiable ones, including age, sex, and genetic predisposition. The interplay of these aspects may differ in different populations of patients, the course of the disease, the level of complications, and the effectiveness of treatment [1].

These relationships are highly complex and need to be fully understood to develop appropriate preventive measures, to maximize treatment interventions and to minimize the overall cardiovascular disease burden. Early diagnosis and treatment of people with high-risk factors is still one of the pillars of contemporary cardiovascular care [2].

The interaction between hypertension, dyslipidemia, and autonomic regulation is a topic of many research works but there are still many gaps in comprehending the interaction of these conditions in various patient groups. Theoretical constructs of the cardiovascular risk like the Framingham Risk Score and the endothelial dysfunction concept imply that the accumulation of exposure to both metabolic and hemodynamic stress promotes vascular damage. Nevertheless, certain regional and demographic differences, including the ones that occur in the Eastern European and Central Asia population, tend to be overrepresented in the analysis of the world. In addition, the comorbidity of hypertension and dyslipidemia is thoroughly described but there has been no comprehensive description of the association of autonomic nervous system (ANS)

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functioning and vascular tone in patients with hypotension thus a major gap in personalized cardiovascular care [3].

In the attempt to fill the said gaps, this paper will synthesize the results of three interconnected studies, (1) the evaluation of cardiovascular risk factors in patients with Stage II hypertension with both cerebral circulatory disorders and none, (2) an examination of hypertension prevalence among patients with combined dyslipidemia, and (3) the correlation between the peripheral blood flow and the activity of the autonomic nervous system in young women with idiopathic arterial hypotension. The integrated methodological framework was that which used a combination of clinical examination, retrospective analysis of data and vascular imaging, such as ultrasonography and angiography, to assess both structural and functional cardiovascular parameters. It is hoped that by combining data of these non-homogenous groups of patients, the study will be able to bring out patterns of comorbidity, physiological control, and systemic risk in different cardiovascular conditions [4].

The initial results have shown that hypertensive persons with cerebral impairments have increased prevalence of obesity, diabetes and cardiovascular disease in family history than persons without cerebral complication. On the same note, hypertension and combined dyslipidemia co-existence greatly increases risks of atherosclerosis and ischemic events highlighting the necessity of dual-target therapy. Conversely, young women who experience idiopathic arterial hypotension exhibit disturbed peripheral circulation characterized by autonomic dysregulation, and this indicates that the ANS balance is important in ensuring hemodynamic stability. It is based on these observations that cardiovascular risk is multifactorial and that there are common mechanisms that connect vascular tone, lipid metabolism, and neural control [5].

The implication of this study is not just limited to management of the disease but to the overall context of preventive cardiology. The metabolic and neurovascular risk factors can be identified early, and effective solutions can be developed that are based on a combination of pharmacological therapy, lifestyle change, and autonomic control. The combined conclusions underline the importance of interdisciplinary cooperation between the work of cardiologists, neurologists, and endocrinologists to develop unique treatment models. Ultimately, this synthesis contributes to refining cardiovascular risk prediction, optimizing preventive care, and reducing the burden of CVD at both individual and population levels [6].

2. Materials and Methods

This study employed a mixed descriptive and analytical design to investigate the interrelationship between major cardiovascular risk factors hypertension, dyslipidemia, and idiopathic arterial hypotension and their physiological and clinical manifestations. The study relied on the synthesis of three independent yet complementary studies that were carried out in the period of 2010-2024 both in clinical and outpatient settings. The former analyzed cardiovascular risk factors in fifty patients (40 72 years old) with Stage II hypertension, in equal proportions group with and without cerebral circulatory disorders. Obesity, diabetes, and lipid abnormalities were assessed through clinical examinations, determination of blood pressure, assessment of body mass index (BMI) and biochemical analysis [7].

The second study was a retrospective study examining 1,173 dyslipidemic patients to identify the incidence of arterial hypertension in patients with combined dyslipidemia (total cholesterol levels above 6.7 mmol/L and triglyceride above 2.3 mmol/L). The prevalence of comorbidity, therapeutic interventions, and demographic data of the patients were studied based on the review of the medical record. The third trial was done and consisted of 210 young women aged 16 35 years diagnosed with idiopathic arterial hypotension, and the autonomic nervous system activity was assessed by vegetative

indices, and the measurement of peripheral blood flow through ultrasound angiography of major arteries and veins was conducted. All data were statistically analyzed to identify correlations between metabolic, hemodynamic, and autonomic variables. Ethical approval was obtained for each component, and patient confidentiality was maintained throughout. The integration of clinical, retrospective, and functional data provided a comprehensive understanding of the multifactorial nature of cardiovascular risk and regulation across different patient populations [8].

3. Results and Discussion

Risk Factors in Hypertensive Patients with Cerebral Impairments

Hypertension is a major cardiovascular risk factor, often complicated by cerebral circulatory disorders. This study aimed to assess the prevalence of cardiovascular risk factors in patients with Stage II hypertension (HTN), comparing those with and without cerebral impairments [9].

To evaluate cardiovascular risk factors in Stage II hypertensive patients with and without cerebral circulatory disorders.

Fifty patients aged 40–72 years (20 men, 30 women) undergoing combined antihypertensive therapy were studied.

Patients were divided into two groups: Hypertension without cerebral impairments ($n = 25$, mean age 55.5 ± 2.8 years) Hypertension with cerebral impairments ($n = 25$, mean age 57.7 ± 1.43 years). Cerebral conditions included initial signs of cerebral insufficiency ($n = 10$), stage I dis-circulatory encephalopathy ($n = 10$), and stage II dis-circulatory encephalopathy ($n = 5$).

Table 1. Clinical examination and questionnaires were used to identify risk factors.

Risk Factor	Group 1 (HTN without cerebral disorders)	Group 2 (HTN with cerebral disorders)
Systolic BP (mmHg)	138.3 ± 5.9	149.3 ± 3.2
Diastolic BP (mmHg)	89.3 ± 4.1	97.1 ± 2.2
BMI (kg/m^2)	31.2 ± 1.8 (60%)	33.3 ± 0.5 (72%)
Sedentary lifestyle	40%	48%
Family history of CVD	68%	72%
Hypercholesterolemia	28%	20%
Smoking	48%	44%
Alcohol abuse	16%	4%
Diabetes / impaired glucose tolerance	8%	28%

The distribution of clinical and lifestyle-related risk factors among hypertensive patients, with and without cerebral disorders, is summarized in Table-1. Notably, patients with cerebral complications (Group 2) exhibited significantly higher systolic and diastolic blood pressure levels, as well as a higher prevalence of obesity and impaired glucose tolerance, compared to those without cerebral involvement (Group 1).

Obesity, diabetes and cardiovascular disease of family history were more prevalent among patients with cerebral complications. The important issue is the early detection of the modifiable risk factors in order to prevent the severe complications and to enhance the quality of life.

Existence of cerebral circulatory diseases in hypertensive patients is linked with high load of cardiovascular risk factors. It is important to identify and manage these factors early enough to avoid additional cerebrovascular and cardiovascular complications. Pharmacologic therapy according to the risk profile of an individual, lifestyle intervention, and strict blood pressure management are suggested. Cerebral impaired patients with hypertension at stage II have a greater prevalence of cardiovascular risk factors as compared to patients without cerebral complications. Lifestyle interventions, strict blood pressure control, and pharmacologic therapy tailored to individual risk profiles are recommended.

Stage II hypertensive patients with cerebral impairments demonstrate a higher prevalence of cardiovascular risk factors than those without cerebral complications. Targeted risk assessment and management can improve clinical outcomes and reduce the progression of both cardiovascular and cerebral disorders [10].

Prevalence of Hypertension in Patients with Combined Dyslipidemia

Hypertension (HTN) and dyslipidemia are major cardiovascular risk factors that often coexist, increasing the risk of atherosclerosis, coronary artery disease, and cerebrovascular events. This study aimed to determine the prevalence of hypertension in patients with combined dyslipidemia.

To assess the prevalence of arterial hypertension in patients with combined dyslipidemia (CD) and associated comorbidities.

Retrospective analysis of 1173 patients with dyslipidemia attending outpatient consultations (2010–2017).

CD was defined as total cholesterol > 6.7 mmol/L and triglycerides > 2.3 mmol/L, corresponding to IIb, III, and V phenotypes.

CD was found in 380 patients (32.4%), with 44.5% men.

Most frequent in age groups 41–50 (25.5%) and 51–60 (34.5%).

Comorbidities in CD patients:

Hypertension: 70%

Ischemic heart disease: 38.4%

Brachiocephalic artery atherosclerosis: 41.1%

Hypolipidemic therapy: statins 55.5%, fibrates 13.7%

Antihypertensive therapy: 89%

The coexistence of hypertension and combined dyslipidemia represents a significant cardiovascular risk. Dyslipidemia may contribute to endothelial dysfunction and increased arterial stiffness, which predispose to elevated blood pressure. Early detection and combined management of both conditions are essential to prevent atherosclerotic complications. It is recommended to use lifestyle modification, diet modification, and pharmacologic treatment that is aimed at addressing the abnormalities of blood pressure and lipids [11].

Combined dyslipidemia among patients can be characterized by high hypertension levels. Usual blood pressure checks and overall cardiovascular risk management are required among this population to lower morbidity and mortality. Peripheral Blood Flow and Autonomic Nervous System in women with the Idiopathic Arterial Hypotension. Idiopathic arterial hypotension (IAH) is the condition of chronic low blood pressure, which has no discernible secondary causative factor. Reproductive age women are hit especially. This paper will look at the correlation between peripheral blood flow and the autonomic nervous system (ANS) in women suffering IAH. To examine how the peripheral blood flow is influenced by the activity of the autonomic nervous system (ANS) in young women with idiopathic arterial hypotension (IAH).

210 women aged 16–35 years with systolic BP $\leq$ 98 mmHg were studied.

ANS balance assessed using the vegetative index (VI).

Group 1: Sympathetic predominance (n = 60, VI +14)

Group 2: Parasympathetic predominance (n = 150, VI –7)

Ultrasound angiography was used to evaluate arteries (vertebral, carotid, brachial, radial, femoral) and veins (great saphenous, femoral, posterior tibial, perforating veins).

The findings suggest that autonomic nervous system dysfunction contributes to impaired peripheral circulation in women with IAH. Reduced parasympathetic activity and impaired vascular reflexes may explain chronic hypotension and associated clinical symptoms. Early recognition of ANS dysfunction could improve management strategies, including lifestyle interventions, pharmacologic support, and physical counter-maneuvers [12].

Women with idiopathic arterial hypotension exhibit impaired peripheral blood flow associated with autonomic nervous system dysregulation. Comprehensive assessment of vascular and autonomic function is essential to guide individualized management and improve quality of life.

Peripheral blood flow in women with IAH is significantly influenced by ANS tone. Parasympathetic predominance is associated with reduced blood flow, contributing to hypotension symptoms [13].

These studies collectively emphasize the importance of comprehensive cardiovascular risk assessment:

In hypertensive patients, obesity, diabetes, and family history significantly elevate complication risk [14].

Dyslipidemic patients frequently have coexisting hypertension, underscoring the need for combined therapy.

Autonomic regulation plays a critical role in hypotensive patients, affecting peripheral circulation and symptom severity.

Early detection and individualized management of these risk factors are essential for preventing cardiovascular complications and improving patient outcomes [15].

4. Conclusion

Cardiovascular risk factors manifest differently across patient populations with hypertension, dyslipidemia, and idiopathic arterial hypotension, but their early recognition is universally crucial for preventing complications. The occurrence of cerebral circulatory disorder in patients with Stage II hypertension is linked to more prevalence of obesity and diabetes and a family history of cardiovascular disease, which identifies the necessity of risk assessment and the need to tailor interventions. Combined dyslipidemia often occurs with hypertension, which is a combination that greatly increases the chances of atherosclerosis, coronary artery disease, as well as cerebrovascular events. The management, comprising lifestyle change, dietary treatment, and pharmacologic therapy to treat both blood pressure and lipid abnormalities is necessary to decrease the morbidity and long-term complications.

Autonomic nervous system dysregulation has a role in the pathogenesis of impaired peripheral blood flow in young women with idiopathic arterial hypotension as well as in the clinical presentation of hypotension. Autonomic imbalance can be recognized so that it can be approached individually warranting individualized approaches that may be physical counter-maneuvers, pharmacologic support, or lifestyle modifications to enhance the quality of life and vascular functioning. All in all, these studies highlight that early diagnosis, holistic risk evaluation and tailored care are essential in lowering the morbidity and mortality of cardiovascular diseases. Cardiovascular care needs pharmacologic

treatment but must be supplemented with optimisation of lifestyle, comorbidity attention, and autonomic and vascular monitoring. An active and patient-focused care can help to avoid the development of cardiovascular and cerebrovascular diseases, improve clinical outcomes, and eventually decrease the population-level burden of cardiovascular disease.

REFERENCES

- [1] A. V. Chobanian, G. L. Bakris, H. R. Black et al., "Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)," *Hypertension*, vol. 42, pp. 1206–1252, 2003.
- [2] D. M. Lloyd-Jones, J. C. Evans, M. G. Larson et al., "Differential impact of blood pressure and cardiovascular risk factors by age and sex," *JAMA*, vol. 294, pp. 898–904, 2005.
- [3] S. M. Grundy, N. J. Stone, A. L. Bailey et al., "2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol," *Circulation*, vol. 139, pp. e1082–e1143, 2019.
- [4] P. M. Kearney, M. Whelton, K. Reynolds et al., "Global burden of hypertension: analysis of worldwide data," *Lancet*, vol. 365, pp. 217–223, 2005.
- [5] W. H. Frishman, "Pathophysiology and clinical management of dyslipidemia," *Cardiol. Rev.*, vol. 18, pp. 67–74, 2010.
- [6] P. Palatini and S. Julius, "Autonomic dysfunction in arterial hypotension and its cardiovascular implications," *Hypertension*, vol. 30, pp. 1037–1042, 1997.
- [7] Y. Shimizu, T. Hashimoto, T. Ishii et al., "Role of autonomic nervous system in idiopathic arterial hypotension in young women," *Clin. Auton. Res.*, vol. 12, pp. 179–184, 2002.
- [8] S. Yusuf, S. Hawken, S. Ôunpuu et al., "Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study," *Lancet*, vol. 364, pp. 937–952, 2004.
- [9] B. Williams, G. Mancia, W. Spiering et al., "2023 ESC/ESH Guidelines for the management of arterial hypertension," *Eur. Heart J.*, vol. 44, pp. 1759–1852, 2023.
- [10] P. Palatini and G. Reboldi, "Hypertension and the risk of cardiovascular disease in different populations: the role of dyslipidemia," *Curr. Opin. Cardiol.*, vol. 27, pp. 410–416, 2012.
- [11] A. V. Poznyak, N. K. Sadykhov, A. G. Kartuesov et al., "Hypertension as a risk factor for atherosclerosis: Cardiovascular risk assessment," *Front. Cardiovasc. Med.*, vol. 9, Art. no. 959285, 2022.
- [12] J. J. Dalal, T. N. C. Padmanabhan, P. Jain, S. Patil, H. Vasnawala, and A. Gulati, "LIPITENSION: Interplay between dyslipidemia and hypertension," *Indian J. Endocrinol. Metab.*, vol. 16, no. 2, pp. 240–245, 2012.
- [13] J. Wyszynska, E. Łuszczki, G. Sobek, A. Mazur, and K. Dereń, "Association and risk factors for hypertension and dyslipidemia in young adults from Poland," *Int. J. Environ. Res. Public Health*, vol. 20, no. 2, p. 982, 2023.
- [14] S. E. Kjeldsen, "Hypertension and cardiovascular risk: General aspects," *Pharmacol. Res.*, vol. 129, pp. 95–99, 2018.
- [15] P. Jeemon, R. Gupta, C. Onen, A. Adler, T. A. Gaziano, D. Prabhakaran, and N. Poulter, "Management of hypertension and dyslipidemia for primary prevention of cardiovascular disease," Unpublished, 2018.