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CONTEMPORARY APPROACHES TO THE DIAGNOSIS OF ARTERIAL HYPERTENSION IN YOUNG ADULTS

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Introduction. Arterial hypertension (AH) is a major modifiable determinant of cardiovascular health, increasingly recognized among young adults and associated with a substantial lifetime burden of cardiovascular morbidity and mortality. The 2024 European Society of Cardiology (ESC) Guidelines define young adulthood as the period from 18 to 40 years and emphasize the increasing prevalence and clinical relevance of elevated blood pressure (BP) in this population [1]. Epidemiological data from a nationwide Swedish study involving more than 1.7 million 18-year-old men demonstrated an increase in the prevalence of hypertension over several decades, underscoring the importance of early detection of elevated BP [2]. The global cardiovascular burden attributable to hypertension has also increased substantially, with hypertension-related cardiovascular mortality and disability contributing significantly to the overall disease burden between 1990 and 2019 [3].

Materials and Methods. A focused narrative literature review was conducted based on publications from 2019 to 2026 addressing the diagnosis of arterial hypertension in adolescents and young adults. The literature search used combinations of the following keywords: “arterial hypertension,” “young adults,” “adolescents,” “blood pressure measurement,” “ambulatory blood pressure monitoring,” “home blood pressure monitoring,” and “secondary hypertension”. Publications were selected according to their relevance to

contemporary diagnostic approaches, with priority given to clinical guidelines, epidemiological studies, and original investigations involving young populations.

Results and Discussion. Accurate diagnosis of hypertension begins with standardized office BP measurement, including appropriate patient preparation, use of a validated device with a correctly sized cuff, and repeated measurements. The 2024 ESC Guidelines recommend confirming an office diagnosis of hypertension, defined as systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg, through out-of-office BP measurement or repeated office measurements [1].

Ambulatory blood pressure monitoring (ABPM) enables automated BP assessment over a 24-hour period and provides information on daytime, nighttime, and 24-hour BP levels. ABPM is particularly valuable in young adults because it facilitates the identification of white-coat and masked hypertension while also providing information on nocturnal BP and circadian BP patterns [1]. According to the 2024 ESC Guidelines, hypertension on ABPM is defined by a mean daytime BP $\geq 135/85$ mmHg, a 24-hour mean BP $\geq 130/80$ mmHg, or a mean nighttime BP $\geq 120/70$ mmHg [1]. In young individuals, 24-hour ambulatory BP monitoring may therefore provide clinically relevant information beyond conventional office measurements by characterizing BP variability and circadian patterns [4].

Central BP assessment may provide additional information regarding central hemodynamics in young individuals; however, methodological differences in measurement and calibration can substantially affect the obtained values [4]. Accordingly, 24-hour ambulatory central BP monitoring may be considered a promising complementary approach to conventional peripheral BP assessment, although further methodological standardization and establishment of age-specific reference values are required before its routine incorporation into hypertension diagnostics [5].

Out-of-office BP assessment is particularly relevant in young adults because the white-coat phenomenon may lead to an overestimation of BP when diagnosis relies exclusively on office measurements [1]. Conversely, masked hypertension may remain undetected when office BP is within the normal range despite elevated BP during routine daily activities [1]. Home blood pressure monitoring (HBPM) therefore represents an important complementary diagnostic approach; however, its use remains limited among adolescents and young adults with hypertension, highlighting the need for

broader implementation of validated home BP measurements in this population [6].

Young age at hypertension onset should also prompt consideration of secondary causes. The 2024 ESC Guidelines emphasize that secondary hypertension is relatively common among young adults referred for specialist evaluation and recommend appropriate screening in young patients with confirmed hypertension [1]. Potential causes include primary aldosteronism, renal and renovascular disease, obstructive sleep apnea, endocrine disorders, medication- or substance-induced hypertension, and the use of recreational drugs or certain supplements [1].

The diagnostic evaluation should additionally include assessment of hypertension-mediated organ damage and associated cardiovascular risk factors [1,7]. In a cohort of adolescents and young adults referred to a tertiary hypertension clinic, 14.5% of patients had an identifiable secondary cause of hypertension, whereas evidence of hypertension-mediated organ damage was detected in 65.5% of participants [7]. These findings support the value of targeted investigation for secondary hypertension and systematic assessment of target-organ involvement in young individuals with confirmed hypertension [7].

Additional diagnostic information may be obtained through electrocardiography, echocardiography, assessment of renal function and urinary albumin excretion, and, in selected patients, evaluation of arterial stiffness [1]. Assessment of hypertension-mediated organ damage may be particularly informative in adults younger than 40 years because conventional short-term cardiovascular risk assessment tools have limited applicability in this age group [1]. Accordingly, the diagnostic evaluation of hypertension in young individuals should incorporate age-appropriate criteria and a structured assessment of BP, cardiovascular risk factors, potential secondary causes, and target-organ involvement [8].

Emerging technologies include wearable and cuffless BP-monitoring devices, central BP assessment, and digital BP telemonitoring. Despite their potential to facilitate frequent or continuous BP assessment, current evidence does not support replacing validated office, home, or ambulatory BP measurements with cuffless technologies in routine clinical practice, given the need for further validation and standardization of measurement accuracy [1].

Conclusion. Contemporary diagnostic strategies for arterial hypertension in young adults should integrate standardized office BP measurement, out-of-

office monitoring, targeted evaluation for secondary causes, and assessment of hypertension-mediated organ damage. Such a multidimensional approach enables more accurate BP phenotyping and facilitates the early recognition of individuals at increased lifetime cardiovascular risk.

References

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