CONCEPTS IN HYPERTENSION

A Journal Article Based Approach to Understanding the Clinical Aspects of Hypertension

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Article of Interest

Strandgaard J et al. Autoregulation of Brain Circulation in Severe Arterial Hypertension. British Medical Journal. 1973. (Click to Access)

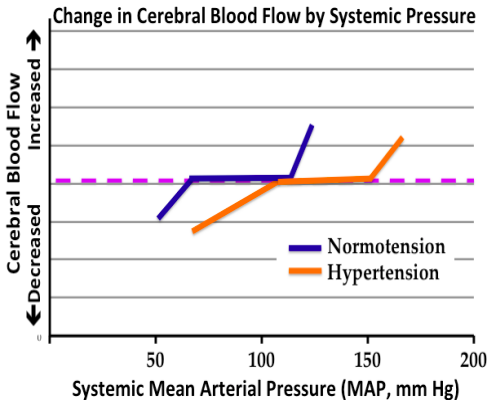
Context and Study Objective

Patients often report dizziness or lassitude upon initiation of antihypertensive therapy. Given that the brain maintains cerebral perfusion within a narrow range despite variable systemic pressures (autoregulation), decreases in systemic blood pressure (BP) should not lead to symptoms of cerebral hypoperfusion/hypoxia such as dizziness. The present study sought to explore whether poorly controlled hypertension impairs the autoregulatory process.

Design, Setting, and Participants

Ten hypertensive individuals with BP in excess of 160/110 mm Hg complicated by end organ damage were studied. Three individuals served as "normotensive controls" but suffered from vertigo, presenile dementia, or alcoholism. While without end organ damage, 1 patient was hypertensive. Cerebral blood flow was determined by differences in arterial-venous oxygenation.

Results



-Figure: Autoregulation resulted in constant cerebral perfusion despite moderate BP variation from baseline pressures.
-Figure: Among hypertensives, mean prestudy BP was 196/122 mm Hg with a lower limit of autoregulation of 168/96 mm Hg. At lesser pressures, cerebral blood flow declined and symptoms of hypoxia (malaise, somnolence) developed.
-Figure: Among control patients, BP was lowered from an average of 144/94 mm Hg to 94/58 mm Hg before autoregulation failed and symptoms occurred.
-Figure: In both groups, autoregulation was preserved with moderate elevations in systemic BP such that cerebral hyperperfusion was avoided. Severe hypertension resulted in autoregulatory failure and transmission of systemic BP to the cerebral vasculature. The BP threshold for failed autoregulation was higher among hypertensives.

Clinical Perspective

-Arterial smooth muscle hypertrophy allows for preserved autoregulation despite longstanding hypertension but at the cost of impaired dilatation at lower pressures; the latter can result in symptoms from decreased cerebral blood flow.
-Over time, the autoregulatory curve can be reset with BP control. As such, the symptoms of hypoperfusion should not be confused with a medication "allergy" and are not a contraindication to gradual reduction in BP. Rather, patients should be educated and reassured that symptoms will improve with time.
-Since these symptoms are more pronounced in those with longstanding or marked elevations in pressures, I tend to "start low, go slow."
-Shortcomings: The study contained only a dozen patients; "healthy controls" had comorbids and one had hypertension. However, these results are consistent with the overall literature; more recent studies focus on esoteric aspects of the autoregulatory process.

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