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Stiffness or Reflection? A Critical Appraisal of Energy Drink–Induced Vascular Changes

LETTER TO THE EDITOR

To the Editor,

I read with great interest the article by Yaşar et al,[1] entitled "Evaluating the Acute Effects of Energy Drink Consumption on Arterial Stiffness in Healthy Young Adults," recently published in the *Anatolian Journal of Cardiology*.[1] While the study addresses a clinically relevant topic, I would like to highlight some methodological and interpretive concerns.

First, the distinction between the Augmentation Index (AIx) and arterial stiffness is critical. Augmentation Index is a composite parameter influenced by peripheral vascular resistance, wave reflection, and heart rate, rather than a direct measure of wall stiffness.[2] The fact that the gold-standard measure, pulse wave velocity (PWV), remained unchanged throughout the study strongly suggests that the observed changes in AIx reflect transient hemodynamic modulations in wave reflection and vascular tone rather than an actual increase in arterial stiffness.[3]

Second, the absence of a control group is a significant limitation. Without a placebo or a water-intake arm, it is difficult to determine whether the observed effects were specifically caused by the energy drink ingredients or were merely a physiological response to fluid ingestion, caffeine's known acute effects, or even a "white-coat" effect related to the measurement environment.

Third, the 2-hour post-consumption data present a physiological contradiction. The authors reported a significant decrease in total vascular resistance and diastolic blood pressure at the 2-hour mark. This suggests a transient adrenergic surge followed by a compensatory vasodilator rebound, which is inconsistent with a sustained increase in arterial stiffness.[4,5]

In conclusion, given the stable PWV and the complex nature of AIx, I believe that characterizing the findings as an increase in "arterial stiffness" may be misleading. I suggest that the results would be more accurately described as acute modulations of wave reflection dynamics. Therefore, I believe that the results should be reinterpreted as acute hemodynamic modulations of wave reflection dynamics.

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