Lowering homocysteine with vitamin supplements to treat drug-resistant hypertension

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Using B vitamins to lower homocysteine levels is an effective means of reducing blood pressure and may be especially useful in the management of drug-resistant hypertension, according to researchers at the University of Maine and University of Arkansas.

UMaine emeritus professor of psychology Merrill Elias, who also is emeritus cooperating professor in the Graduate School of Biomedical Sciences and Engineering, collaborated with Dr. Craig Brown, adjunct professor of ophthalmology at the University of Arkansas, to publish a peer-reviewed editorial in the *American Journal of Hypertension* on the treatment of drug-resistant hypertension by lowering homocysteine levels with B vitamins.

Approximately 12.8 percent of the world population experiences drug-resistant hypertension, defined as a failure to reach a target blood pressure of 140/90 mmHg using three classes of antihypertension medication. A newer definition of hypertension, 130/80 mmHg, makes successful management even more difficult to achieve.

Homocysteine is an intermediate compound involved in vitamin regulation. Elevated homocysteine is the result of genetic mutations or inadequate stores of vitamins B6, B12, folate and riboflavin (B2). High homocysteine is associated with impaired nitrous oxide synthesis, which is related to small vessel vasoconstriction and is a risk factor for hypertension, cardiovascular disease, stroke and neurological diseases. Lowering of homocysteine is relatively inexpensive because it is achieved by providing vitamin supplementation.

While recent literature supports the efficacy and safety of homocysteine lowering in the treatment of hypertension, the validity of this generalization has been challenged, generating a controversy that has lasted over 15 years and has slowed the use of homocysteine lowering as a means of treating hypertension, according to the researchers.

Elias and Brown reviewed the literature on both sides of the controversy and conclude that the early criticisms of homocysteine lowering were premature and that supplementation with sufficient nondietary-sourced vitamins B2 (riboflavin), B6, folate and B12 can safely lower blood

pressures as much as 6 to 13 mmHg.

The updated reference value for normal homocysteine is ≤10 μmol/L. However, many laboratories define normal homocysteine levels as high as 11.4 μmol/L. Elias and Brown argue that there is a need to update laboratory values for normal homocysteine and to determine whether risk-protective values should be even lower.

Vitamin treatment is a potentially important adjunct to drug treatment of drug-resistant hypertension, but therapy should be conducted under the direction of a physician or qualified health care provider, the researchers note.

More information: Merrill F Elias et al, New Evidence for Homocysteine Lowering for Management of Treatment-Resistant Hypertension, *American Journal of Hypertension* (2021). DOI: 10.1093/ajh/hpab194

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