Zinc deficiency: An independent risk factor for high blood pressure

Faryal Tahir, Zainab Majid, Laila Tul Qadar

Madam, according to American College of Cardiology/American Heart Association (ACC/AHA) 2017 guidelines, blood pressure (BP) in adults can be categorized as normal (<120/<80 mm Hg), elevated (120-129/<80 mm Hg), or hypertension (HTN) stage 1 (130-139 or 80-89 mm Hg) or HTN stage 2 (≥ 140 or ? 90 mm Hg).[1] Because prevention is better than cure, one should emphasize more on the risk factors associated with increased BP rather than various treatment strategies. It is found that populations with low intake of dietary zinc (Zn) have an increased prevalence of HTN, indicating a potential for inverse relation between serum Znlevels and BP.[2] Znis required by human body in very small amounts. Too much or too little of it can affect the body's ability of maintaining BP in its normal range.

Zn deficiency has been recently reported as an independent risk factor for the development of HTN by a study published in American Journal of Physiology-Renal Physiology.[3] This study has revealed the role of Zn bioavailability in regulating BP. Findings of the study have concluded that Zn contributes to the adjustment of BP by modulating sodium transport through kidney.[3] It has been demonstrated that there is increased reabsorption of renal sodium because low levels of Zn directly promote sodium-chloride cotransporter (NCC)-mediated sodium reabsorption in the distal convoluted tubules (DCT) of kidney and subsequently causes elevation in BP.[3] So, Zn deficiency directly upregulates renal NCC.[3] Interestingly, reversal of these effects has been noticed with the repletion of dietary Zn.[3] This is how a direct link between dysregulated renal sodium transport and Zn deficiency induced HTN has been established for the first time.[3]

Zn deficiency, being a modifiable risk factor for HTN, can be easily overcome. People with gastrointestinal (GI) diseases, vegetarians, pregnant and lactating women, older infants who are exclusively breastfed, sickle cell disease and alcoholics are high risk entities for Zn deficiency. Comparatively, oysters contain more Zn than any other food but red meat and poultry are the most widely consumed sources.[4]

Interpretation of certain mechanisms by which Zn deficiency leads to increased BP may have a vital impact on the management strategies of HTN in chronic disease settings. For instance, physicians should evaluate Zn deficiency promptly and consider it as a separate entity to be managed appropriately. Adequate level of Zn plays a vital role in maintaining BP and ultimately reducing the incidence of devastating sequelae.

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4th Year Students, Dow University of Health Sciences, Karachi, Pakistan.
Correspondence: Zainab Majid. Email: zainabmajid36@gmail.com

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