Abstract Title: Vitamin C depletion is spontaneous intracerebral hemorrhage risk factor

Press Release Title: Can Citrus Ward Off Your Risk of Stroke?

Objective: Vitamin C Depletion Is Spontaneous Intracerebral Hemorrhage Risk Factor.

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Background: Scurvy is caused by vitamin C deficiency, specifically a plasma vitamin C concentration < 11 µmol/L, and may have hemorrhagic manifestations. Vitamin C depletion (< 38 µmol/L) is associated with cardiovascular diseases and could increase ICH risk.

Design/Method: In a prospective case-control study, we measured the plasma vitamin C concentration in 65 consecutive patients with acute ICH and 65 matched controls. For cases, diagnosis and determination of ICH locations were based on the findings of brain imaging. Participants’ plasma ascorbate concentrations were determined via high-performance liquid chromatography. Vitamin C levels were categorized according to limits established in the laboratory: deficiency, depletion, or normal. Demographic, clinical, radiological and biological data were first analyzed between cases and controls. Cases data were then analyzed according to ICH localization and according to plasma Vitamin C status.

Results: A total of 130 participants were enrolled. In our cohort, 41% of cases had a normal vitamin C status, 45% showed depletion and 14% deficiency. The mean plasma vitamin C concentration in the population was 45.8 ± 22.6 µmol/L. Patients with intracerebral hemorrhage had vitamin C depletion (35.3 µmol/L ± 19.9 µmol/L); control vitamin C status was normal (56.2 µmol/L ± 20.4 µmol/L) (p<0.001). High blood pressure (p = 0.008), alcohol consumption (p = 0.023) and overweight (p = 0.038) were strong deep intracerebral hemorrhage risk factors. Patients aged ≥ 75 years had more lobar than deep intracerebral hemorrhages (p = 0.014). Vitamin C depletion was not associated with acute or 3-month mortality but was associated with longer hospitalization (p = 0.026).

Conclusions: Vitamin C depletion is a spontaneous ICH risk factor. There are multiple physiopathological mechanisms given the involvement of vitamin C in blood pressure regulation and collagen synthesis. Additional work is required to confirm our findings.

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