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Dietary amino acids and risk of stroke subtypes: a prospective analysis of 356,000 participants in seven European countries

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Little is known about the relevance of dietary amino acids to risk of stroke subtypes. To date, only two prospective studies have been published on the topic^(1,2), thus further evidence is needed from large cohorts. We examined the associations of dietary amino acids with ischaemic and haemorrhagic stroke in the EPIC (European Prospective Investigation into Cancer and Nutrition) study. We analysed data on 356,142 people from seven European countries (Denmark, Germany, Italy, the Netherlands, Spain, Sweden and the United Kingdom). Dietary intakes of 19 individual amino acids were obtained using validated country-specific food frequency questionnaires, calibrated using additional 24-hour recalls. Blood pressure was measured at recruitment in 267,642 (75%) participants. Multivariable Cox regressions adjusted for socio-demographic characteristics, lifestyle factors and medical history were used to estimate hazard ratios (HRs) of ischaemic and haemorrhagic stroke for 1 standard deviation (SD) differences and fifths of intakes of each individual amino acid. After a mean follow-up of 12.7 years, 4295 people had an ischaemic stroke and 1375 people had a haemorrhagic stroke. After mutual adjustment for all amino acids and corrected for multiple testing, higher intake of proline was found to be associated with 12% lower risk of ischaemic stroke (HR [95% CI] of 0.88 [0.82–0.94] for 1SD higher calibrated intake in multivariable-adjusted model). The association was independent of systolic and diastolic blood pressure. Among dietary sources of protein, intake of proline was most strongly correlated with intake of dairy protein (Pearson correlation coefficient $r = 0.73$). Higher intakes of isoleucine, leucine, valine, phenylalanine, threonine, tryptophan, glutamic acid, serine and tyrosine were associated with lower risks of ischaemic stroke in the multivariable model, but all these associations attenuated when adjusted for proline. For haemorrhagic stroke, no statistically significant associations were observed in the continuous analyses after correcting for multiple testing. Higher intakes of proline were associated with lower risks of ischaemic stroke, independent of other dietary amino acids. Further studies are needed to assess the casual relevance and possible implications for prevention.

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References

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