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# Vitamin E intake, serum tocopherols and blood pressure in UK adolescents

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Previous studies suggest that high serum antioxidant levels such as vitamin E could reduce the risk of hypertension[1–3]. More evidence is needed to confirm the effects of dietary vitamin E on reducing blood pressure (BP), especially among adolescents. The aim of this study is to determine the relationship between dietary vitamin E intake, serum tocopherols and blood pressure in 10–19 year old UK adolescents.

585 adolescents aged 10–19 years old from the UK National Diet and Nutrition Survey (2008–2012)[4] were included in the analysis. Information was collected by interview, anthropometric data and BP were measured, and dietary data was assessed from a four-day food record. BP data was transformed to systolic BP Z-scores (SBPZ) and diastolic BP Z-scores (DBPZ). Hypertensive adolescents were defined according to the European Hypertension Society Standard[5]. Univariable and multivariable linear and logistic regression was undertaken for continuous outcomes (BP values and BPZ-scores) and binary outcomes (hypertension v.s. normal BP) respectively. Confounders were selected according to a Directed Acyclic Graph and likelihood ratio tests.

Mean SBP was 112·0 ± 10·7 mmHg and mean DBP was 63·1 ± 8·5 mmHg. 7·2 % of the total sample was hypertensive. Dietary intake of vitamin E was 8·8 ± 4·2 mg/day. No significant relationship between dietary vitamin E and serum tocopherols was found. In the fully adjusted linear regression, each 1 mg increase in daily vitamin E intake was associated with 0·03 (95 % CI: −0·07 to 0·00) decrease in DBPZ ($p = 0·048$), and every 1 μmol/L increase in serum α-tocopherol was associated with 0·005 (95 % CI: −0·01 to −0·0001) decrease in DBPZ ($p = 0·047$). But no relationship was found with SBPZ or BP values. In the adjusted logistic regression, higher dietary vitamin E intake was found to reduce the risk of hypertension (OR = 0·789, 95 % IC: 0·64 to 0·96, $p = 0·019$). Associations between dietary vitamin E intake/serum α-tocopherol and SBPZ/DBPZ could be found in the following table.

| Nutrients | β-coefficient | 95 % CI | | p Value |
|---|---|---|---|---|
| ***With systolic blood pressure Z-scores*** | | | | |
| Dietary vitamin E intake (mg) | −0·026 | −0·058 | 0·006 | 0·110 |
| Serum α-tocopherol (μmol/L) | −0·004 | −0·010 | 0·001 | 0·148 |
| ***With diastolic blood pressure Z-scores*** | | | | |
| Dietary vitamin E intake (mg) | −0·034 | −0·067 | −0·0003 | 0·048* |
| Serum α-tocopherol (μmol/L) | −0·005 | −0·010 | −0·0001 | 0·047* |

*$p < 0·05$

In conclusion, higher dietary vitamin E intake and serum α-tocopherol were found to have an association with reduced DBPZ and reduced risk of hypertension in UK adolescents aged 10–19 years.

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