

Pomegranate juice ellagitannin metabolites are present in human plasma and some persist in urine for up to 48 hours.

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ABSTRACT

Ellagitannins (ETs) from pomegranate juice (PJ) are reported to have numerous biological properties, but their absorption and metabolism in humans are poorly understood. To investigate the pharmacokinetics of pomegranate ETs, 18 healthy volunteers were given 180 mL of PJ concentrate, and blood samples were obtained for 6 h afterwards. Twenty-four-hour urine collections were obtained on the day before (-1), the day of (0), and the day after (+1) the study. Ellagic acid (EA) was detected in plasma of all subjects with a maximum concentration of 0.06 ± 0.01 micromol/L, area under concentration time curve of 0.17 ± 0.02 (micromol x h) x L(-1), time of maximum concentration of 0.98 ± 0.06 h, and elimination half-life of 0.71 ± 0.08 h. EA metabolites, including dimethylellagic acid glucuronide (DMEAG) and hydroxy-6H-benzopyran-6-one derivatives (urolithins), were also detected in plasma and urine in conjugated and free forms. DMEAG was found in the urine obtained from 15 of 18 subjects on d 0, but was not detected on d -1 or +1, demonstrating its potential as a biomarker of intake. Urolithin A-glucuronide was found in urine samples from 11 subjects on d 0 and in the urine from 16 subjects on d +1. Urolithin B-glucuronide was found in the urine of 3 subjects on d 0 and in the urine of 5 subjects on d +1. Urolithins, formed by intestinal bacteria, may contribute to the biological effects of PJ as they may persist in plasma and tissues and account for some of the health benefits noted after chronic PJ consumption. Whether genetic polymorphisms in EA-metabolizing enzymes (e.g., catechol-O-methyl transferase and glucuronosyl transferase) are related to variations in response to PJ remains to be established.