LIGNANS, FLAVONOLS, AND BREAST DEVELOPMENT

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Background and Aims: Phytoestrogens are dietary micronutrients with known hormonal activity. They have been associated with reduced cancer risk, and they alter pubertal onset in experimental animals and in some human studies. Lignans and flavonols are dietary phytoestrogens found at high levels in the western diet. The Breast Cancer and Environment Research Project (BCERP) cohort is investigating environmental exposures and puberty in females.
Methods: Breast stage, dietary recall data, body size, and other information were collected for 1239 girls enrolled at 3 US sites during 2004-2007, followed through 2010. Phytoestrogen intake was calculated for lignans and flavonols using a new micronutrient database. Associations between phytoestrogens and breast stage (pubertal [B2+] vs prepubertal [B1]) were investigated using bivariate comparisons and Hazards Ratios (HR) with 95%-confidence intervals (CI), adjusting for energy intake, body mass index, race, age and parental education. Data are currently available for 747 girls.
Results: Breast development was present in 81% (N=606/747) at the last visit. Mean level of lignan intake was 0.12 ± 0.07 mg/day; mean flavonol intake was 5.2 ± 3.6 mg/day, mainly quercetin. Energy and quercetin intakes were greater among girls at B2+ compared with B1. Age at B2+ was similar across quartiles of intake, for example HR 1.03 (CI 0.77-1.25) in the 4^{th} vs 1^{st} quartile of lignan intake. We found no attenuation of the BMI-effect on puberty by dietary lignans. Additional analyses will examine how associations may differ at different times during development.
Conclusions: Preliminary results from this longitudinal study suggest that dietary lignans and flavonols are not directly associated with pubertal developmental. Dietary intake during puberty may reflect different windows and duration of exposures than urinary biomarkers of phytoestrogens. Timing of dietary intake may influence associations of weak hormonal agents in relation to pubertal development.
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