

A prospective study of dietary flavonoid intake and risk of glioma in US men and women

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Background

- Flavonoids are diverse plant constituents with neuroprotective and anti-tumor effects
- Dietary flavonoid intake may decrease glioma risk, an association that has not yet been investigated in humans

Flavonoid Subclass	Constituents	Dietary Sources
Flavan-3-ol monomers	Catechins and epicatechins	Teas, apples, berries
Polymeric flavonoids	Proanthocyanidins, theaflavins, and thearubigins	Teas, apples, berries
Flavonols	Quercetin, kaempferol, myricetin, and isorhamnetin	Onions, broccoli, apples
Anthocyanidins	Cyanidin, delphinidin, malvidin, pelargonidin, petunidin, peonidin	Berries, grapes, red wine
Flavanones	Eriodictyol, hesperetin, naringenin	Citrus fruits
Flavones	Apigenin, luteolin	Parsley, celery, thyme

Project goal: To evaluate the association between habitual dietary flavonoid consumption and glioma risk.

Methods

Study Population: Participants in the female Nurses' Health Study (NHS) and Nurses' Health Study II (NHS2) and the male Health Professionals Follow-up Study (HPFS)

Exposure: Average long-term (up to 30 years) and recent (up to 12 years) intake of total flavonoids and six major flavonoid subclasses, derived from validated quadrennial food frequency questionnaires

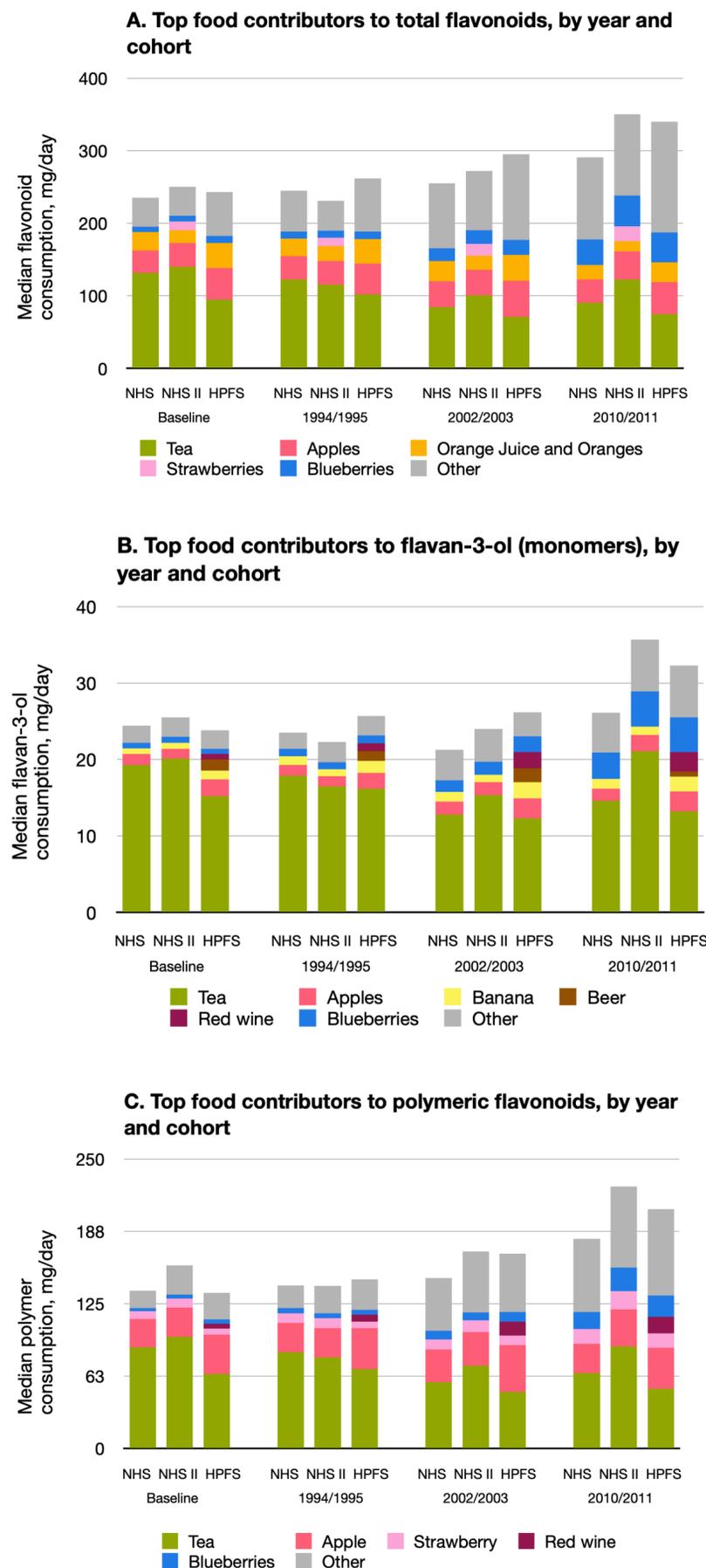
Primary Outcome: Incident glioma

Statistical Analysis: Multivariable-adjusted Cox proportional hazards regression to evaluate the association between quintiles of recent or long-term dietary flavonoid intake (total flavonoids, and each of six subclasses) and risk of incident glioma

Secondary Analyses:

- Lagged models (excluded flavonoid intake in the 8 years preceding diagnosis or end of follow-up)
- Glioblastoma (GBM), an aggressive and common subtype of glioma, as the outcome
- Mutual adjustment for long-term tea consumption

Results



- Long-term total flavonoid, flavan-3-ol, and polymeric flavonoid intake was associated with decreased glioma risk

Long-term intake, pooled cohorts (NHS, NHS2, HPFS):

Flavonoid Subclass	Hazard Ratio* (95%CI)	P _{trend}
Total flavonoids	0.79 (0.59-1.05)	0.04
Flavan-3-ol monomers	0.76 (0.57-1.01)	0.04
Polymeric flavonoids	0.82 (0.61-1.09)	0.05

* Highest vs. lowest quintile of intake

Recent intake, pooled cohorts (NHS, NHS2, HPFS):

Flavonoid Subclass	Hazard Ratio* (95%CI)	P _{trend}
Total flavonoids	0.93 (0.69-1.23)	0.30
Flavan-3-ol monomers	0.83 (0.63-1.09)	0.18
Polymeric flavonoids	0.85 (0.65-1.13)	0.27

* Highest vs. lowest quintile of intake

- There were no associations with other flavonoid subclasses
- Associations were attenuated but similar in the recent, lagged intake, and glioblastoma models
- Associations with flavan-3-ols and polymers were no longer significant after additional adjustment for tea intake

Conclusion: Increased habitual dietary intake of flavan-3-ol and polymeric flavonoids, especially those predominant in tea sources, was associated with decreased risk of glioma in pooled analysis of three prospective cohort studies of men and women.

Limitations and future directions

- We were unable to distinguish between green, black, or other types of tea, which have varying levels of flavonoids
- Additional studies with more precise data are warranted to further describe the association between tea, flavonoids, and glioma risk

References

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