Grapefruit juice and coffee

Hey Alice!

I've heard that drinking coffee and grapefruit juice at around the same time can extend the effects of caffeine. Is this true? I know that grapefruits can increase the bioavailability of some drugs... what about caffeine? Is this at all dangerous?

Thanks. You're awesome, Alice!

Answer

Dear Reader,

Way to stay alert and look out for your health! The short answer to your question is that research shows that there's no serious interaction between grapefruit juice, caffeine, and its bioavailability. For readers not familiar with bioavailability, it refers to the amount of a drug (or food, or other substance) that enters your bloodstream and can cause a bodily reaction. So, if you are eating, drinking, or otherwise consuming more than one substance, they may impact each others bioavailabilities. And you're correct that grapefruit juice might interact with other food and drugs a person consumes, which is why the consumption of grapefruit products are discouraged when using certain medications. Intrigued? Read on for more info on how it happens.

The small intestine has an enzyme called CYP3A4, which often helps with drug metabolism. However, grapefruit juice (and grapefruits themselves) may stop CYP3A4 from working properly, leading to more of a drug entering the bloodstream instead of being broken down in the small intestine. This, in turn, may cause more of the drug to be in the body and might lead to liver and muscle damage. It also may block transporters, which are cells responsible for helping with absorption of substances into the body, potentially causing a drug to be less effective. However, the level of CYP3A4 (in the intestine) is unique from person to person, so this interaction may affect each person differently. Drugs that interact with grapefruit juice include some (but not all) statins, blood pressure medications, antihistamines, anxiety medications, corticosteroids, drugs for abnormal heart rhythm, and drugs for organ transplant rejection.

On the other hand, the metabolizing enzyme for caffeine, CYP1A2, isn't affected by grapefruit juice. One study found that there was a small effect of grapefruit juice in inhibiting caffeine breakdown and absorption but not enough to actually affect the way the body metabolizes the caffeine. Other studies have indicated that grapefruit juice and caffeine didn't interact at all. As
such, it's unlikely that grapefruit juice will cause an adverse reaction or somehow impact with the bioavailability of caffeine. If you have any more questions regarding caffeine, a good place to start is the Caffeine, Energy Boosters, & Other Performance Enhancing Drugs [2] in the Go Ask Alice! Alcohol and Other Drugs [3] archives.

Cheers!

Alice!

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