Pathology 438 Final Examination

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Drug-Nutrient Interactions: Select any of the drugs or drug classes below and explain how it affects diet (nutrient absorption). Either suggest an alternative drug and/or explain how an individual can compensate for any effect on nutrition

Antacids contain alkaline ions that directly neutralize acidic ions such as gastric acid (HCl). Most people take antacids to neutralize the burning pain sensation of "heartburn" which the main symptoms of gastroesophageal reflux disease (GERD). The chemical reaction of antacids on stomach acid creates a new compound which is why we can call the reaction a complexation, or complex forming, reaction. It creates a tetracycline complex with divalent cations that forms an insoluble complex. (Halloran, More Applications of Pharmacology & Toxicology: Week 4, 2015) Antacids can allow microbes to survive in the gastrointestinal tract and alter nutrient absorption. The stomach needs a low pH, or an acidic environment, to kill other microbial bacteria that are consumed with food and to properly break down the food into macronutrient particles so that they can be further broken down in the small intestine later. If a person takes antacids for acid reflux daily for more than just a few days, it can start to affect both of those purposes for the stomach acid's acidic pH.

For example, long term antacid use is linked to the formation of ulcers because the higher and more neutral pH post antacid supplementation allows heliobacter pylori bacteria, which is commonly found in our stomach, to thrive and dig a hole through the stomach lining, thus allowing the stomach acid to leak through the layers too and cause an ulcer. (Stomach, 2015) This more neutral stomach pH can allow other bacteria to survive in the stomach and cause food poisoning too. In terms of digestion, having a higher stomach acid pH improperly breaks down our food, leading to malabsorption of Vitamin B12, folate and iron. (Halloran, 2015) A deficiency in this can lead to neurological damage such as dementia and motor damage. (Jameson R. Lam, 2013) It also affects Vitamin D creation and metabolism which can lead to calcium malabsorption, which further leads to bone reabsorption problems like osteoporosis. Further, when the improperly digested food moves through the pyloric sphincter into the duodenum and small intestine, the intestine peristalsis will not be able to properly perform mechanical function due to the texture of the chyme, thus causing constipation. Finally, antacids cause urine pH to rise, which reduces kidney tubule reabsorption of salicylate. (Halloran, 2015)

Alternatives to taking antacids if one is susceptible to heartburn symptoms are to eat more "alkaline foods" like dark leafy greens and avoiding food irritants or foods that cause inflammation and are more acidic, like alcohol, coffee, chocolate, sugar, and spicy food. Supplementing the diet with teaspoons of apple cider vinegar will help buffer the pH of the gastric acid and drinking water before eating can help too. Do not eat an hour before sleeping too. As a Chiropractor, I would check the integrity of the stomach organ itself, looking for any herniation of the stomach at the fundus or at the cardia. These areas are likely herniated or have muscle contraction problems if the patient has a history of vomiting - from morning sickness, eating disorders, food poisoning, or alcohol overdose. Correcting these herniation via manual adjustment to the location of injury can greatly improve proper stomach contraction function and then decrease the incidence of acid reflux symptoms.

Personal Care Products: Select one of the product types and the named compound usually contained in it. Discuss any facts on acute and chronic toxicity through dermal exposure, and discuss alternatives to

Aluminum chlorohydrate is the active ingredient in most antiperspirants available for purchase in stores. It blocks the sweat glands from getting to the skin's surface which is what reduces underarm odor. (Antiperspirants and Breast Cancer Risk , 2014) However, some researchers speculate that the aluminum can cross into the skin where it can be stored and may change estrogen receptors of breast cells, thus increasing a risk for breast cancer if used for a long time. (Pineau A, 2014) It is noted that it is more likely to cross into the skin through a razor nick. This potential risk for chronic toxicity has a lot of people looking for safer anti-odor alternatives. There does not seem to be clear research findings that prove that the aluminum is absorbed through the skin enough to have adverse effects though. This is definitely a subject for further study.

Safer alternatives to antiperspirant sticks that do not contain aluminum chlorohydrate are deodorant stones which are large, smooth crystals of potassium aluminum sulfate that must be wetted with water when applied. The difference between potassium alum and aluminum chlorohydrate is that potassium alum is a much larger molecule that is not thought to be absorbable through skin. (5 Deodorant Alternatives, 2015) However, if you want to completely eliminate aluminum from your armpits many companies sell natural aluminum-free sticks such as Burt's Bees, JASON, Trader Joe's Kiss My Face and several other companies all offer aluminum-free deodorant sticks. Alternatives to antiperspirant sticks are home remedies like mixing baking soda and cornstarch with a little water, citric acid from lemon juice and spritzing alcohol on the armpits.

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