12 14th Marcia Wilkinson Lecture: Chocolate, craving and triggering

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Introduction

The role and the influence of dietary constituents as triggers of headache and migraine attacks is a matter of debate. Peatfield claimed in the eighties that about 19% of migraineurs are sensitive to cheese and chocolate. Sometimes an elimination diet is an important therapy in treating migraine and other headache. See Mauskop's book, the Headache alternative, and you are a good professional! It is generally thought that certain foods can provoke typical migraine attacks, and this form is generally called dietary migraine (Dalessio, 1972). Trigger-factors precede the attack in 12-24 hours in predisposed patients, differ from subject to subject, can work alone or in combination, and do not always precipitate an attack in the same patient. One of the foods most frequently reported both by patients and doctors is chocolate. Secondary, chocolate is by far the most common food-item that people report that they crave. The definition of craving is a strong desire or urge for a particular food. My question is: is there a possibility that graving and triggering are connected in migraine patients? Chocolate is a special food. For many it has a uniquely attractive taste. It has a cultural importance and is used frequently as a gift on special occasions or to say "thank you" or other meanings. Firstly, some details about history.

History of chocolate

The cacao tree (theobroma cacao= food of god) is native of central and South America. Today, it is cultivated in the Caribbean, Africa, Asia, Samao and New Guinea. There are three main varieties of cacao trees, the

most common is Forastero, which accounts for nearly 90% of the world production of cacao beans. Many people believe that the Aztecs, living in Central Mexico, first developed chocolate. Yet 2500 years ago, the ancient Maya, who inhabited parts of Southern Mexico and Central America, certainly consumed chocolate. As a bitter-tasting drink made of cacao beans, mixed with a variety of local ingredients. It was thought to cure many diseases, for the stomach and the catarr. The Spanish conquistador Cortez is said to have brought three chests full of cacao beans to King Carlos of Spain. In the 17th century the chocolate-drink, a sweetened chocolate beverage, was a luxury, but common among European nobility. Soon the French, English and Dutch cultivated cacao in their colonies. The painter Wattiez symbolised the multi-cultural aspect of cacao-beans and chocolate. In 1828 Dutch chocolate maker, Conrad van Houten, patented an inexpensive method for pressing the fat from roasted beans. Van Houten's machine- a hydraulic press- reduced the cacao butter by nearly a half. The powder was treated with potassium or sodium carbonates so that the powder would mix more easily with water. This process is known as "Dutching". Today the Swiss and the Belgians are famous for their chocolate. Joseph Fry in 1849 was a famous English chocolate maker.

The problem of craving

Food cravings are very common, although highly selective. About 68% of men, and 97% of women. Chocolate is by far the most common food item that people report to crave. Some will even describe them as chocoholics. There are two major explanations: It is pleasant, the attractive taste is a major reason. The other is that it is a reflection of physiological mechanisms. The last suggestion has been made repeatedly that chocolate contains "drug-like" substances that act on the central nervous system. To eliminate the different reasons I will try and explain the different reasons for craving.

Biological mechanisms

Chocolate contains:

- Phenylethylamine (PEA); it acts as a neuromodulator, has a rapid turnover, its effect can be blocked by dopamine-antagonist, and is aroused to release dopa. Cheese and sausage also contain high levels of PEA, yet they are rarely craved. Particular patients suffering migraine who have reduced MAO-B activity can be provoked by craving.

- Methylxanthines (caffeine, theobromine)

- Anandamides. This is an endogenous cannabinoid neuro-transmitter, possible responsible for subjective feelings.

- Carbohydrates. These can influence serotonin synthesis.

- Endorphin-mediated response to high fat/high sweet in chocolate. Naloxone can reduce significantly total energy intake, but most markedly the intake of high fat/high sweet.

- Mg

- Additives in chocolate, as nuts etc.

Psychological effect

There is a relationship between negative mood and chocolate craving.

The menstrual cycle

Food craving can be a symptom of the premenstrual syndrome. There is an increased energy intake during the second phase from 4 to 35%. But the question is, is there a specific increase in the craving for sweet foods? Or also for high fat/high sweet foods? Or is the attraction of chocolate in the premenstrual phase an attempt to increase the intake of Mg, as the levels of Mg are lower in the pre-menstrual phase. An attempt of self-medication? Although there are only 26 mgr of Mg in milk-chocolate, this theory is not convincing.

Is craving a physiological or psychological reaction?

Cacao-butter is the fat that, when removed from chocolate-liquor, leaves cacaopowder. The pharmacological ingredients are all in the powder. If one eats white chocolate, one has the fat and sugar intake, not the pharmacological constituents. If one consumes powder, one takes the pharmacological ingredients, not the fat and the sugar. Capsules containing the pharmacological ingredients have an effect similar to taking nothing. Concluded: it is unlikely that the constituents of chocolate generate a physiological effect. The attraction of chocolate lies in its taste. The combination of sweet and fat approaches the ideal hedonic combination. The sweet science of chocolate is: more than a food, but less than a drug.

Chocolate and headache

Trigger-factors are factors as lifestyle and environmental factors. Problems are the data referred by the patient and the difficulty in reproduction. Many patients and doctors believe that eating chocolate may induce migraine attacks. The results are very controversial. Generally, chocolate was the first after alcoholic drinks. It was indicated as a trigger by 30% of migraine and 27% of tension-type headache patients. Elimination diet is also a point of discussion. The IHS-classification 2004 coded a group of headaches associated with substance use or withdrawal. Paragraph 8.1.5 shows headache by food components and additives. See also the note: PEA, tyramine and aspartame have been incriminated but their headache-inducing potential is not sufficiently validated. Some remarks about mechanism of action and biochemical aspects. Chocolate is especially rich in a variety of vaso-active amines, including phenylethylamine. PEA is metabolized by MAO, and possible headache may be related to a deficient metabolism. Contrary, chocolate has a low concentration of PEA, So, PEA may not be the strongest headache trigger present in chocolate. Littlewood in 1982 and Soliman in 1987 found a lower mean platelet phenolsulphotransferase P activity in diet-sensitive migraine. Possibly this enzyme plays a role in dietary related migraine. The concept food allergy, the fact that supersensitivity

of certain migraine patients to certain foods is mediated by the immune system remains to be established. Another possibility is the presence of a genetic factor that predisposes the patient to food allergy. Up to now only three double-blind, placebo-controlled studies have been performed to examine the possible role of chocolate in migraine. The study of Moffet in 1974 and the study of Marcus in 1997 found no relationship between eating chocolate and a migraine attack. The study of Gibb in 1991, also a double-blind, placebo controlled study tried to test the hypothesis that chocolate is able to initiate a migraine attack in some patients who believe themselves to be sensitive to it. The quality of blinding to the taste of the chocolate and placebo was optimal. He showed the existence of such a relationship. It should also be considered that the three studies present some important differences and several limitations that restrict the interpretation of the results.

Some conclusions

The studies mentioned are quite different and have conflicting results. The patient's experiences with chocolate craving can lead to an assumption of a casual relationship between chocolate and headache. Sweet craving has been identified as a prodrome to the onset of headache and in the premenstrual phase. Sweet craving is also related to stress, and what is then the trigger factor? The relationship between chocolate and migraine is not clear at all. In special cases it can be a trial of error to eliminate special foods, and especially chocolate. But, chocolate is a unique product, it is attractive, also for you and your patients.