Title:
Does What We Eat and the Bacteria in Our Gut Determine Our Migraine Risk?

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Session Title:
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Keywords:
Migraine headaches, Nitrates and Nitric oxide and gut flora and fauna

References:


Abstract Summary:
Research from the Human Microbiome Project indicates that bacteria in the mouth and gut may make an individual is prone to developing migraine headaches. Foods like wine, green leafy vegetables and processed meats increase the amount of nitric oxide in the GI System, triggering migraine headaches.

Learning Activity:

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVES</th>
<th>EXPANDED CONTENT OUTLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants will be able to verbalize the relationship between diet and gut flora and fauna</td>
<td>Eating foods high in nitrates such as wine, green leafy vegetables and processed meats increase Nitric oxide, which in high levels within the mouth and gut have recently been shown to have an association with developing migraine headaches in migraine suffers.</td>
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<td>Participants will be able to verbalize that Migraine prone individuals have increased Nitric acid in their mouth and gut flora, and an increase in the amount of genes able to code for nitrate, nitrite, and nitric oxide-related enzymes.</td>
<td>Knowing this, it would be beneficial to advise patients who are migraine prone to avoid foods that are high in nitrates, as a preventive measure against developing migraine headaches.</td>
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Abstract Text:
**Background:** Approximately 38 million Americans suffer from Migraine Headaches annually. Recently research has found that Migraine headaches could be related to the foods we eat, and how those foods affect the gut flora and fauna of our bodies. The American Gut Project (AKA Human Microbiome Project funded by the NIH) is based out of a lab run by several scientists including Rob Knight, a Microbial Ecologist, at the University of California at San Diego. The project uses samples from a small army of “citizen scientists” who voluntarily have provided samples of fecal matter from their own digestive tracts to the project for research. The project has included over 1,702 oral samples and 1,996 fecal samples, according to Gonzalez, A., Embriette, H., Naseer, S., Gilbert, J., Viirre, E. Knight, R. (2016).

Knight et al. (2016) have discovered a secret ecosystem or micro biome that exists within the human body that consists of microbes living within our bodies, which could be the key to many diseases and even obesity. This “microbiome” is the result of lifestyle choices and diet that have carved out a specific internal flora and fauna that controls our over health.

Nitrate reducing bacteria are found in the oral cavity of most individuals, but the research team believes it is significant that in many people who are non-migraine prone individuals, they appear to have higher numbers of these nitrate reducing microbes than those who are migraine prone.

**Purpose:** To educate Health Care providers about the recent research concerning the etiology of migraine headaches, in order to change treatment approaches and practice in the future.

**Methodology:** One twenty-five articles on Migraines and the findings from Human Microbiome Project/American Gut Project were reviewed for background, clinical practice and treatment approaches. Both Medline and CINAHL data bases were explored.

**Results:** Knight et al. have found that individuals who consume foods that contain nitrates ie; chocolate, wine, processed foods high in nitrates, green leafy vegetables and certain medicines report a relationship between these foods and migraine headaches. These foods containing nitrates are reduced to nitrites by bacteria present within the mouth. Under certain conditions once absorbed into the blood stream, these nitrites are converted into nitric oxide. Nitric oxide is beneficial for cardiac patients in reducing the blood pressure and stimulate improved blood flow. Interestingly enough four out of five cardiac patients who are experiencing chest pain or have severe congestive heart failure, when given the drug nitroglycerin develop headaches.

When analyzing American Gut Project fecal and oral samples for microbes, Knight et al. (2016) found varying bundled amounts of bacterial flora in both migraine prone individuals and non-migraine prone individuals. The research team used a special tool to differentiate the data and determined a significant increase in genes which encode nitrate, nitrite and nitric oxide-related enzymes in migraine prone individuals versus non-migraine prone individuals. In fecal samples, these genes were significantly more present numerically, but in comparison to oral samples the amount of genes showed an even greater difference between the two groups statistically.

**Conclusions:** The next step of this puzzle for the American Gut Project is to separate the Migraine prone specimens out into two groups, those who report auras prior to migraine onset and those who do not report auras prior to headache onset. It is hope that analysis of their gut flora and fauna will vary even more to explain this clinical difference in the two migraine prone groups. In the meantime, limiting "trigger food" (foods high in nitrates), such as wine, green leafy vegetables, and process meats could be clinically beneficial as clinical management strategies when treating patients who are deemed to be migraine prone.