

## “What Exacerbates Meniere’s Disease?”

“What does exacerbates Meniere’s Disease?” Well, most people afflicted with this condition will tell you that potentially everything does! In the next several paragraphs, we would like to briefly summarize what is currently known about Meniere’s Disease so that we may discuss conditions in life that may exacerbate it.

### **Inner Ear Anatomy and Function**

The inner ear is a delicate structure within the temporal bone. It has microscopic membranes which sense hearing (the cochlea) and balance (the semicircular canals). These membranes are bathed in fluids (endolymph and perilymph) which are rich in minerals and salts. The inner ear is constantly recycling these fluids. In Meniere’s disease there is believed to be too much endolymph secondary to either too much production or decreased absorption. The buildup of endolymph (endolymphatic hydrops) causes rupture of the inner ear membranes, which in turn causes severe vertigo, hearing loss, tinnitus, and ear pressure.

### **Meniere’s Disease and Meniere’s Syndrome**

Meniere’s Disease, by definition, is endolymphatic hydrops that occurs spontaneously and cannot be attributed to any known cause. Meniere’s Syndrome is endolymphatic hydrops that occurs secondary to a known case. For example, some patient’s who develop an inner ear infection with a sudden hearing loss in one ear may later go on to develop tinnitus, fullness, and attacks of vertigo. These patients would be classified as having Meniere’s Syndrome since we can relate their condition as being secondary to a prior inner ear infection. There are nonetheless several theories as to what causes Meniere’s Disease. Some of the newer focuses are on the role of allergy in Meniere’s Disease and the overlap in symptoms between patients with Meniere’s Disease and patients with Migraine headaches.

### **Meniere’s Disease and Allergy**

The two most common types of allergy are reactions to substances in the air which are inhaled (inhalant allergy) and reactions to substances which are eaten (food allergy). Most of the patients (around 80%) who have an allergy component to their Meniere’s Disease also have symptoms of nasal congestion and a runny nose, while 30% note a sensitivity to various foods. Common inhalant allergens include ragweed, grass, pollen, dust mites, and mold while common food allergens are wheat, corn, milk, egg, yeast, and soy products.

So why not test every patient with Meniere’s Disease for allergy? The reason that we do not is because only one out of every three patient’s with Meniere’s Disease will test positive for allergy. Furthermore, this testing can be expensive and therefore is usually reserved for patients with bilateral Meniere’s Disease and symptoms that persist despite conventional treatment. Importantly, properly managing these allergies can show an improvement in patient’s symptoms.

### **Meniere’s Disease and Migraine**

There is also evidence that Meniere’s Disease can be very similar to what occurs in patient’s with Migraine headaches. In fact a specific type of Migraine called “Basilar Migraine” has symptoms of occipital (back of neck) headache, nausea, vomiting, vertigo, tinnitus, hearing loss, and double vision. Many of these symptoms also occur in patients with Meniere’s Disease. Migraine is thought to be more common than Meniere’s Disease and can affect up to 15% of the population. Furthermore, up to 30% of patients with Meniere’s Disease can have Migraine. So one sees that there is a lot of overlap between these two disorders.

Genetic analysis of a family of patients with migraine headaches has found defects in a set of genes that are responsible for a channel (or gate) in cells that regulates the flow of minerals and salts such as calcium, sodium, and potassium. These minerals are important for cellular function and blood vessel diameter. The blood vessels in the brain can increase (vasodilate) or decrease (vasoconstrict) in size so that blood flow to various regions can be controlled. The inner ear is especially sensitive to changes in blood flow and changes in the mixture of these salts and minerals. Such changes can cause the symptoms of Meniere's Disease and Migraine Headaches.

Patients with both Meniere's Disease and Migraine headaches should ideally be managed by specialists in both neurotology and neurology. Although a proper diet is very important, these patients might also need special medicines to decrease the frequency of the headaches. Also by optimally managing migraine, the patient might have better control of his Meniere's Disease.

### **The Importance of Diet in Meniere's Disease**

Following a proper diet is the key to management of Meniere's Disease. In fact, 80% of patients with Meniere's Disease can have their vertigo controlled if they follow a strict diet and take a daily water pill (or diuretic). Because we believe there is a lot of overlap between Meniere's Disease and Migraine, we ask our patients to follow a special 1500 milligram sodium per day diet (see chart below). This diet also asks patients to refrain from eating foods that have been shown to trigger Migraine attacks. Some of the more important dietary foods and beverages that can trigger an attack or exacerbate Meniere's Disease are explained in detail in the following paragraphs.

### **Sodium and Salt**

Sodium is in almost every food that we eat. Sodium chloride or table salt makes most foods taste better. A proper amount of sodium and chloride as well as other salts and minerals is important for normal body function. Sodium and potassium are very important in the function of nerve cells in the brain and inner ear. Too much sodium can make the inner ear more sensitive or reactive, and thus more susceptible to an attack of Meniere's Disease.

Still, there is more to following a proper Meniere's Diet than just not using the salt shaker. In general, fresh fruits and vegetables and most fresh meats and poultry are low in salt. Most cheeses are high in salt. Prepared foods can be high in salt. When a person eats at a fast food establishment or restaurant, he or she has no control over the amount of salt used in the preparation of that meal. Lastly, diet soft drinks, although low in calories, can have a significant sodium content.

### **Caffeine and Chocolate**

Caffeine is a type of drug known as a methylxanthine. Other members of this class include theophylline (which is found in tea) and theobromine (which is found in chocolate). Caffeine is found in coffee and many soft drinks. All of these drugs are very similar to one another in their structure, and thus act in a similar fashion. These drugs are believed to constrict the blood vessels in the brain and inner ear and thus upset the normal metabolism of these areas. Furthermore, decreased blood flow in the inner ear is believed to interfere with endolymph absorption, resulting in the buildup of endolymph and the symptoms of Meniere's Disease.

### **Alcohol**

Beer, wine and mixed drinks all contain various percentages of alcohol. The active ingredient in these beverages is known as ethyl alcohol. Ethyl alcohol is rapidly absorbed from the gastrointestinal tract into the blood. It then travels to the brain and inner ear. Here it dissolves into the cell membrane and can make the membrane "leaky", allowing the various salts and minerals in the cell to leak out, and vice versa. A leaky membrane in the inner ear can trigger an attack of Meniere's Disease. Furthermore, ethanol can interfere with the body's metabolism of other drugs used to treat Meniere's Disease, such as diazepam (or Valium) or meclizine (or Antivert). Harmful levels of these drugs can then build up in the body. Also, chronic alcohol use can permanently injure the brain, eyes, and peripheral nerves, all of which are necessary for proper control of our balance mechanism.

## **Nicotine and Smoking**

Nicotine is classified as an acetylcholine receptor stimulant. Acetylcholine receptors are found throughout the nervous system and are important for normal body functions. Nerve cell receptors that respond to nicotine are found in the brain, spinal cord, and muscles. Nicotine can affect the brain and inner ear by constricting blood vessels and by triggering nausea and vomiting.

Furthermore, chronic smoking causes other problems. It can block the effect of medications such as diazepam and meclizine, which are used to treat the vertigo of Meniere's Disease. It reduces the diameter of the blood vessels throughout the body and increases the risk of a stroke. There is also evidence that smoking can cause permanent hearing loss. Since smoking can thus permanently injure the hearing portion of the inner ear (cochlea), it seems logical to presume that it can also permanently injure the balance portion of the inner ear (vestibule and semicircular canals), since these two structures are very near one another and share the same fluid system and blood supply.

## **Stress and the Importance of Healthy Lifestyle**

Stress, anxiety, and depression can all adversely affect Meniere's Disease. Patients can experience a significant exacerbation of their symptoms during such times. Although we do not know the exact reason why stress can exacerbate Meniere's Disease, it might have to do with neurotransmitters. These are important chemicals which act in the brain and are necessary for proper mood, and a normal mental state. An upset in the balance of neurotransmitters can be caused by stress and anxiety. This in turn can possibly affect the areas of the brain which interact with the inner ear and balance system. As patients with Meniere's Disease can have a susceptible or "weak" inner ear, it may be more sensitive to stress and anxiety. Proper nutrition, exercise on a regular basis, and relaxation are all important for reducing stress and anxiety.

## **Conclusion**

In summary, there are many things commonly encountered on a daily basis that can exacerbate Meniere's Disease. The recommendations presented above are intended to be used as general guidelines and are certainly not all-inclusive. A proper diet and lifestyle changes should hopefully allow the majority of patients with Meniere's Disease to lead a fairly normal life. Patients who suffer repeated attacks of vertigo despite proper medical management are candidates for surgical therapy.

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## **Meniere's Disease Diet**

Permitted Foods Foods to Avoid

Beverages Decaffeinated coffee, tea, soda fruit juice, water Caffeinated coffee, tea, soda, chocolate, cocoa, beer, wine, more than 24 oz/d of nutrasweet

Sweets Sugar, jelly, jam, candy, honey Chocolate candy or syrup

Desserts Jello, cookies, cake, pie, ice cream, sherbert, pudding Any deserts with chocolate, nuts or yeast

Dairy 2% or skim milk, low salt cheese, yogurt, eggs Buttermilk, sour cream, chocolate milk, imported cheeses

Meat Fresh or frozen chicken, fish, lamb, beef, pork, veal, tuna Ham, bacon, sausage, salami, hot dogs, pepperoni, TV dinners, pickled or canned meats or fish

Fruits Apples, oranges, bananas, kiwi, nectarines, pineapple Avocados, figs, raisins, red plums

Cereal All hot and dry cereal, rice Cereals with nuts or chocolate

Bread Low salt crackers, bagels and commercial breads Doughnuts, coffee cake, sourdough

Vegetables All except those to avoid Lima, navy and pinto beans, fried potatoes, pickles, sauerkraut, olives, peas, onions

Pasta Most pasta noodles Lasagna, macaroni and cheese, fettuccini alfredo

Soups Homemade or low salt non-cream soups Creamy soups, all regular canned soups, bouillon cubes

Miscellaneous Low salt pretzels, unsalted popcorn Pizza, peanut butter, Chinese food, excessive MSG or soy sauce, meat tenderizer