

Histamine, the unknown cause of headaches

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Many people pay a high price for a lovely candlelight dinner with friends, having delicious fish, wine and cheese. Not infrequently a severe headache and feeling unwell is the consequence.

Often these complaints are attributed to the alcohol consumption, to stress in general or to the weather. However, there is often no proof for this. Looking for possible triggers scientists found biogene amines [2,3] some years ago, and especially histamine, to be likely causes. A Danish study investigated how inhaling histamine can cause headaches in migraine patients. Their findings showed how dosage related symptoms were not only found in migraine patients but even in the healthy control group [1].

What is histamine?

Histamine is a biogene amine, which is formed by the decarboxilisation of histidine. It is part of many human body functions and is therefore produced regularly by the organism. Blood and tissue cells store histamine in an inactive form and release it from mast cells when needed, for example when histamine meets allergens in the body. Histamine has different physiological functions: It lowers blood pressure, dilates blood vessels for example in the skin and the mucous tissues, and it leads to contraction of the smooth muscles in the respiratory and the GI tract. Negative effects are hayfever, bronchial asthma and nettle rash. It also plays an important role in allergies or sensitivities to medication.

Apart from the body's own production we consume histamine with food. It is found in almost all foods, especially in those which have been fermented with the help of bacteria or other micro-organisms such as sauerkraut.

Foods which contain significant amounts of histamine

- fish (e.g. tuna, mackerel, anchovy, tinned fish)
- cheese (hard cheese, Emmental, camembert, Roquefort, Brie etc.)
- processed meat (salami, raw ham etc.)
- vegetables (sauerkraut, spinach, tomatoes etc.)
- alcohol (red and white wine, champagne, beer)

Biogene amines are also in chocolate, nuts, eggs, milk, pineapple, papaya, strawberries etc.

An overload of the body with histamine causes health problems, though not only if it is taken in orally from foods or breathed in, but the lack of break down mechanisms also causes symptoms. Excessive amounts of histamine can cause health problems in all people, and in individuals with histamine intolerance even small quantities can lead to problems.

The break down mechanism for histamine: DAO

So, for the reasons already mentioned the body has to protect itself effectively from this highly potent substance. There is a first barrier in

the intestine, the mucous tissue, where the biogene amines are broken down. The enzyme diaminoxidase (DAO) which is responsible for this break down is continuously being produced by the intestinal mucous tissue cells. DAO is mainly found in the small intestine, the liver, the kidneys and the white blood cells.

In healthy individuals foods rich in histamine are largely purged from histamine in the intestine. Remaining traces are broken down by the DAO in the gut lining when passing through.

Actually a valuable co-enzyme is vitamin B6. People with histamine intolerance (HIT) frequently show low vitamin B6 levels.

DAO is a sensitive enzyme, which can be inhibited by other biogene amines, alcohol or some medication. With inflammatory bowel disease the production is decreased as well.

Note! Many pain killers can block the DAO-production or increase the release of histamine from mast cells. The same applies for some sleeping or asthma medication, mucolytics, anti-hypertension substances and antibiotics. Please remind your headache patients of this.

Histamine intolerance

Histamine intolerance (HIT) is defined as an intolerance to histamine which is taken in with food. The cause can be a lack of DAO or a discrepancy between DAO and histamine.

The following symptoms can come with histamine intolerance:

- headaches (in women also stronger before the period)
- tachycardia
- palpitations
- GI problems with diarrhoea
- hypotension
- swollen eye lids
- tissue oedema
- runny nose
- skin redness and hot flushes
- sleep problems
- exhaustion
- joint pains

Histamine intolerance is probably not hereditary but seems to be acquired. It is estimated that about 1% of the population suffer from this. 80% are female and in their forties. This suggests a connection with declining hormone levels.

How to treat histamine intolerance

Because a satisfactory substitute for the enzyme DAO has not really been found, a histamine free diet is the therapy of choice.

In connection with this it should be noted that the histamine content of the foods increases with advancing fermentation. Therefore the most important rule is to eat foods as fresh as possible.

(⁺⁺ In Austria the company Pelpharm is offering Perlind Capsules which contain DAO from pig kidneys. Available from Germany through Medi-line 0049 6341/87329.)

Practitioners should advise their patients who suffer from histamine sensitivity:

- only to eat very fresh fish, or to avoid fish and shell fish altogether.
- to avoid hard cheese, raw ham and salami like preparations, avocados, nuts, berries, tomatoes and bananas as much as possible.
- to be careful with foods which are processed with the help of micro-organisms like beer, sauerkraut etc.
- to be moderate with the consumption of alcoholic drinks.
- to discuss with the therapist or GP whether the prescribed medication might upset their body regulation

Test for DAO levels

Recently we have developed a method of measuring the DAO activity in blood. With the help of an ELISA it is possible to routinely detect the concentration of DAO in full blood, serum or plasma.

The DAO activity in blood correlates with the histamine break down capacity of the organism and therefore represents a suitable marker for diagnosing histamine intolerance and associated symptoms.

* Test info: BTS England, 01903-893591
Test price £ 44.00

Two more phenomena can make the symptoms of histamine intolerance considerably worse: the leaky gut syndrome and an infection with *Helicobacter pylori*.

A leak in the intestine - the leaky-gut syndrome

In people with leaky-gut syndrome the “tight junctions” between the mucosa cells have become loose and with this the permeability of the gut mucosa is increased. The causes for this can include:

A bad diet, taking pain killers and/or antibiotics, gut dysbiosis or psychological stress. The leaky gut mucosa releases substances into the blood stream like allergy causing antigens and histamine, which should normally not be absorbed.

Practice has shown that the well-known allergy of the immediate onset type actually had to be classified into three groups:

- a) The classic immediate onset allergy triggered by specific IgE antibodies.
- b) Histamine intolerance
- c) A combination of a) and b)

In each of these groups the leaky-gut syndrome can occur and again lead to a considerable worsening of symptoms. Diagnosis of Leaky-gut syndrome can be best achieved by a laboratory test showing an increased alpha-1-anti trypsin level in stool. Treating the gut therefore has to be part of a holistic headache and allergy treatment [4].

Helicobacter and migraine

An infection with *Helicobacter* has also often been assumed to be a cause for headaches. In 1998 an Italian study investigated the consequences of an eradication therapy in 225 patients with primary migraine and a serum prevalence of *Helicobacter* of 48. 83% of patients

who had a successful eradication of helicobacter found their migraine was improved significantly (77%) in the following 24 weeks or they were completely symptom free (23%) [5]; an approach worth being followed up.

Unfortunately the study was not randomised or done double blind. A more recent study from Turkey could also demonstrate an improvement of migraine in 75% of patients who had been freed from these germs [6].

Conclusion

Consumption of medication for years and economic costs of millions should be reason enough to look for new diagnostic and therapeutic methods for headaches.

If this makes you think of the possibility of a HIT, a Helicobacter infection or a leaky-gut syndrome in a patient you clearly improve the chances of therapeutic success in chronic headaches.

References:

- [1] Lassen L.h., Heinig J.H., Oestergaard S., Olesen J:
Histamine inhalation is a specific but insensitive test for migraine.
Cephalalgia 1996; 16; 550-553
- [2] Janish R., Steinbrecher I.: Krankheitsbilder bei Histaminintoleranz (Kapitel 4.1 Kopfschmerzen). In: Jarisch R. (Hrsg): Histamin-Intoleranz, Histamin und Seekrankheit. Stuttgart und New York: Thieme Verlag: 2004: 54-57
- [3] Milichap J.G., Yee M.M.: the diet factor in paediatric and adolescent migraine. *Pediatr. Neurol.* 2003; 28(1); 9-15
- [4] Liu Z., Li N., Neu J., Tight junctions, leaky intestines and paediatric diseases. *Acta paediatr.* 2005; 94 (4); 386-393
- [5] Gasbarrini A., deLuca A., Fiore G. et al.:
Beneficial effects of Helicobacter pylori eradication on migraine.
Hepato-Gastroenterol. 1998; (45); 765-770
- [6] Tunca A., Turkay C., Tekin O. et al:
Is helicobacter pylori infection a risk factor for migraine?
A case-control study. *Acta.Neurol. Belg.* 2004 (De.); 104(4);
161-164

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