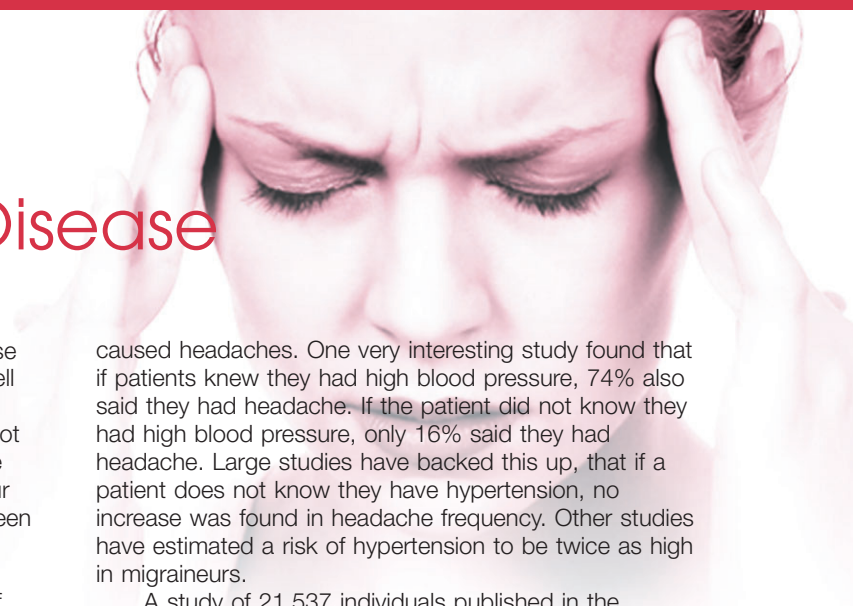


Headache Toolbox

Migraine and Cardiovascular Disease



The presence or absence of cardiovascular disease can influence the risks associated with migraine, as well as the choice of optimal treatment. Migraine itself is considered a primary headache disorder, that is, it is not caused by an underlying disease. However, much time has been spent studying diseases that appear to occur more frequently in migraineurs. If these diseases are seen more frequently in those who have migraine compared with the general population, they are called comorbid disorders. Another source of investigation is whether, if these comorbid disorders are effectively managed, the migraines will improve or become more treatable.

It is common to think of migraines as being related to blood vessels or vascular in origin, despite evidence to the contrary. There is a throbbing nature to the pain, and that suggests blood vessels. Migraines worsen with stress and exercise, are associated with an increase in blood pressure with pain, and have symptoms that at times can resemble strokes.

Cardiovascular conditions believed to be possibly increased in frequency with migraine include Raynaud's phenomenon (see below for a definition), high blood pressure (inconsistently), and ischemic heart disease. Structural heart conditions are sometimes linked with migraine and these include changes in the heart chambers and valves. These disorders are not believed to cause migraine, but they may occur more frequently in those who have migraine.

It is perhaps easiest to look at common vascular disorders and examine their frequency with migraine, as well as the implications for treatment. Recurring headaches over time accompanied by symptoms of migraine are unlikely to be blood vessel in origin. A clue that points to an underlying urgent vascular condition is usually a sudden, new headache, one never before experienced by the patient and occurring like a "thunderclap." Whenever this occurs, vascular conditions should be looked for promptly.

HYPERTENSION

It has long been assumed by both physicians and patients alike that high blood pressure or hypertension

caused headaches. One very interesting study found that if patients knew they had high blood pressure, 74% also said they had headache. If the patient did not know they had high blood pressure, only 16% said they had headache. Large studies have backed this up, that if a patient does not know they have hypertension, no increase was found in headache frequency. Other studies have estimated a risk of hypertension to be twice as high in migraineurs.

A study of 21,537 individuals published in the medical journal *Cephalalgia* in 2006 showed that elevations in diastolic blood pressure (the lower number), not systolic blood pressure (the top number), were correlated with migraine. This would explain why there are such inconsistent findings in studies of migraine associations with hypertension. Most studies do not break down whether the blood pressure elevation is diastolic or systolic. In 2004, the International Headache Society came to the conclusion that chronic mild to moderate elevated blood pressure does not cause headache. Current guidelines require that headaches caused by high blood pressure, and it has to be very high, must go away once the blood pressure drops to normal. At the time of the headache, the systolic blood pressure must be at least 180 and/or the diastolic 120. Minor elevations in blood pressure during the headache, or headaches that persist after the blood pressure drops, do not count as a cause of headache.

CORONARY ARTERY DISEASE

The risk of heart or coronary artery disease is increased with migraine, but only in those who have aura. Aura is defined as a reversible set of neurologic symptoms that generally comes before the migraine headache, usually lasting 5-60 minutes and usually visual. Aura only occurs in about one quarter of those with migraine. The statistics are muddled by risks of smoking and birth control pills which, if not taken out of the mix, are known to increase vascular risks by at least as much, if not more, than migraine itself. The estimate is that migraine with aura doubles the risk of coronary artery disease.

STRUCTURAL ABNORMALITIES OF THE HEART – PATENT FORAMEN OVALE

As noted above, there are structural abnormalities of the heart that occur more frequently in migraineurs, particularly in those who have aura. One of these changes, a patent foramen ovale (PFO), is a small hole that connects the right and left upper chambers of the heart, the atria. PFO in the general population is present in about 25% of all people, the vast majority of whom have no symptoms. PFOs may occur in as many as one-third of those with migraine and in 18% of those with aura. There is no recommendation to close PFOs because the benefit in doing so has not been clear.

RAYNAUD'S SYNDROME AND PERIPHERAL VASCULAR DISEASE

Raynaud's syndrome is a disorder usually associated with cold hands or feet, in which the affected area becomes painful, pale, often with a dusky blue color, resulting in pain. The arteries become constricted in the cold to the point where blood flow is reduced. Caution should be used when treating Raynaud's syndrome with triptans or dihydroergotamine (DHE), as they can result in further narrowing of the arteries. Beta-blockers, frequently used as a migraine preventive, are also avoided with this disorder.

Raynaud's syndrome is combined with other disorders affecting blood vessels not in the heart or head, and these are termed peripheral vascular disease. Peripheral vascular disease can be a clue for increased risk of coronary artery disease. The presence of peripheral vascular disease is often a contraindication for using triptans or DHE for treatment of acute migraine. In part, this is because diseases affecting arteries in the limbs are indicators for likely cardiovascular disease, and in part it is because these medications may also result in further narrowing of blood vessels in limbs.

MIGRAINE TREATMENT WHEN CARDIOVASCULAR DISEASE IS PRESENT

Unfortunately, any migraine treatment that decreases the width of a blood vessel, even very temporarily, cannot be used in those who have or might have cardiovascular disease. In those who are at increased risk by uncontrolled blood pressure, high cholesterol, or several risk factors, such as smoking, diabetes, obesity,

and heredity, these risk factors need to be treated and consideration be given to cardiac testing, such as exercise treadmill or nuclear stress test. It is estimated that triptans (sumatriptan, rizatriptan, and all others in this drug grouping), as well as DHE, can narrow heart blood vessels by 18%. While this is a minor narrowing for a person with normal heart vessels, in those with cholesterol build up, it can become significant.

All non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, diclofenac, and naproxen, now carry a black box label from the US Food and Drug Administration (FDA) because of their association with increased risk of heart attack. NSAIDs do vary in the amount of risk to the heart, with naproxen the safest. Other NSAIDs vary in their heart risk, mostly seen in those who use them frequently. Using NSAIDs not more than 2 days a week is generally safe in most individuals who have never had a heart attack. Other acute, as-needed medications that may help dial down the migraine pain without causing blood vessel narrowing include metoclopramide, prochlorperazine, diphenhydramine, baclofen, acetaminophen, and gabapentin. Trigger point injections and nerve blocks may also be used.

Migraine preventive strategies become very important in individuals with vascular disease and migraine, as acute treatment options are limited. Topiramate, venlafaxine, and blood pressure medications such as propranolol and candesartan, as well as onabotulinumtoxinA, can be highly effective in decreasing both the intensity and frequency of migraine.

In summary, the link of cardiovascular disease and peripheral artery disease with migraine may be present, but it is difficult to separate out from other risk factors often present at the same time such as smoking, diabetes, uncontrolled blood pressure, and other common vascular risks. The presence of coronary artery disease or peripheral vascular disease limits the use of certain acute and preventive migraine treatments. All medicines that cause artery narrowing should be avoided in the presence of cardiovascular or peripheral vascular disease, but there remain multiple effective treatments to reduce migraine pain and frequency.

Deborah Tepper, MD
Cleveland Clinic Headache Center
Cleveland, OH, USA



To find more resources, please visit the American Migraine Foundation