Key Points

1. Research has shown there is a link between pain regulation and blood pressure regulation
2. In healthy people, higher blood pressure is associated with lower pain sensitivity
3. In people with chronic pain this relationship is reversed
4. Study looked at the prevalence of hypertension among 300 chronic pain patients versus 300 non-pain medical patients
5. There was a significantly higher rate of hypertension in the pain group versus the non-pain group
6. Although in general men are more prone to hypertension, in the pain group, women were much more likely to be hypertensive
7. The pain group also had higher rates of antihypertensive, antidepressant, and anxiolytic drug use
8. Pain intensity, but not duration, was associated with hypertension

Definitions

acute - lasting a short, or brief, period of time

antidepressants - medications used to treat depression

antihypertensive - a medication which lowers blood pressure

anxiolytics - type of medication used to treat the symptoms of anxiety

blood pressure - the pressure of blood, as it is pumped by the heart, against the walls of arteries.

cardiovascular - having to do with the heart and blood vessels

chronic - occurring for a long period of time

hypertension - chronic high blood pressure

inverse relationship -

Chronic Pain Linked To Hypertension

The bad news just keeps coming for chronic pain sufferers. Not only is it difficult to find adequate treatments, but chronic pain has been linked to high rates of anxiety and depression as well. Recent research has even shown that chronic pain actually damages the brain and destroys brain cells. As if that weren't enough, chronic pain has now been linked to persistently high blood pressure - also known as hypertension - which of course is not a good thing.

Researchers have known for awhile that the systems that regulate blood pressure and pain are linked in some way. In healthy people, a higher resting blood pressure is associated with a decreased sensitivity to acute pain. In other words, if you're blood pressure is high, you wouldn't feel as much pain if someone stuck you with a pin. Scientists speculate that this link between the two systems is a way to restore normal arousal levels after a painful stimulus. The body responds, or is aroused, initially by pain, but then the pain signals are turned down so that the rest of the body's systems can return to normal.

In people with chronic pain however, the relationship between the two systems is reversed. For a chronic pain sufferer, higher blood pressure levels have been associated with an increased, or higher, sensitivity to pain, as opposed to a decreased, or lower, sensitivity in healthy people. In people with chronic pain, the increased sensitivity extends beyond acute pain as well, with higher blood pressure also being linked to an increased sensitivity to chronic pain.

Given the links between blood pressure and pain, Dr. Stephen Bruehl, a researcher at Vanderbilt University Medical Center, and his colleagues wanted to see if chronic pain was associated with higher levels of hypertension. To do this, they retrospectively examined the medical records of 300 chronic pain patients and compared them to the records of 300 medical patients who were not in chronic pain. They published their results in the March/April, 2005 issue of the Journal of Clinical Pain.

The medical records for the pain group yielded information on demographics, cause of pain, pain duration, pain intensity, history of hypertension, family history of hypertension, and history of medication use. For the non-pain group, records were examined to exclude people who had reported either chronic pain or chronic headaches. Information on demographics, history of hypertension, and history of medicine use was collected for those subjects identified as not suffering from chronic pain.

Both the pain and non-pain groups were comprised of people between the ages of 18-65. The pain group had more women than men (66% female), while the non-pain group had more men than women (55% male). The most common types of pain in the pain group were myofascial (62%), and neuropathic (25%). The pain sufferers reported an average pain intensity of 2.7 out of 5 and had been in pain on average for 37 months.

In analyzing the data, Bruehl and his team found that the pain group had a significantly higher prevalence of hypertension than the non-pain group (see Table 1). Specifically, 39% of the pain group had been clinically diagnosed with hypertension, versus only 21% for the non-pain group. The pain group rate of hypertension was also significantly higher than the national norm (matched for age and race) of 23% in men and 14% in women. The non-pain group, in contrast, was not different from the national norm for either men or women.

The researchers also found significant sex differences in the pain group. Although in general men have a higher rate of hypertension than women, in the pain group a higher percentage of women (41%) were diagnosed with hypertension than men (36%).

To see if pain related medications were associated with the higher rate of hypertension in the pain group, the researchers next looked at the types of drugs being used by people in this group. They found that while narcotic and NSAID use were similar for those in the pain group with hypertension and those in the pain group without hypertension, people in the pain group who also had hypertension were much more likely to be taking antidepressants and anxiolytics (anxiety medicine) than those with chronic pain but without hypertension.

Finally, the scientists used a statistical technique to try to determine which factors played a role in the increased rate of hypertension among the pain sufferers. Not surprisingly, they found that well-known predictors of hypertension, such as age, sex, race, and family history of hypertension, were large contributors; however, they also found that pain intensity predicted hypertension, above and beyond the known demographic risk factors.

Although it can't be proven from this study alone, the authors believe their results, combined with other research, indicate that the relationship between chronic pain and high blood pressure is not easily explained as chronic pain causes high blood pressure. Rather, they believe that chronic pain somehow fundamentally alters the relationship between the cardiovascular and pain regulatory systems.

relationship between two things where an increase in one results in a decrease of the other

myofascial pain - broad group of muscle disorders which involve pain - in various muscles of the body - caused by super sensitive trigger points

neuropathic pain - pain due to nerve damage

prevalence - the number (or percent) of people in a group who have a certain disease or characteristic

retrospective - type of study which examines data - usually in the form of medical records - which was collected before the study began

Source

Bruehl S, Chung OY, Jirjis JN, Biridepalli S. Prevalence of clinical hypertension in patients with chronic pain compared to nonpain general medical patients.Clin J Pain. 2005 Mar-Apr;21(2):147-53.

They go on to offer several possibilities as to the nature of the link between the two systems. First and foremost, Bruehl hypothesizes that a common substance modulates both blood pressure and pain pathways. Thus, chronic pain may exhaust this substance and reduce it's regulatory effect on blood pressure.

Second, the team points out that the hypertensive subjects in the pain group did use more antidepressants and anxiolytics than those without hypertension. Because of this, it could be argued that these drugs were leading to higher blood pressure. However, there is no real evidence for this and there is actually evidence that these types of drugs lower blood pressure.

Finally, Bruehl hypothesizes that body mass may play role in linking pain and blood pressure. Specifically, that people in chronic pain may be less active and thus put on weight. Obesity is a known risk factor for hypertension. While this makes sense, no data on weight was collected in the study, so the hypothesis can not be evaluated.

Continued research is likely to shed light on the exact link between chronic pain and hypertension, but whatever it turns out to be, this study provides yet another reason for chronic pain sufferers to aggressively seek treatment.

Table 1
Percent of People With Clinical Hypertension and Use Of Antihypertensives, By Group

Group	% With Hyper-tension	% Using BP Med's
Chronic Pain	39	36
No Chronic Pain	21	18

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