Joint Pain and Weather

Despite the widespread belief in weather-related pain, and its acceptance as a real phenomenon by the medical community, how good is the evidence?

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Almost everyone has heard comments like, "I don't like winter because the cold makes my joints hurt." Or, "There must be rain coming because my knee is acting up." We tend to take these claims matter-of-factly, but the scientific facts aren't at all clear.

I became interested in the topic when I started a research collaboration with a group of orthopaedic surgeons. I had previously been interested in neurophysiology, so I decided to explore the topic of joint pain as a bridge between neuroscience and orthopaedics. It seemed to me that if I could learn more about the links between weather and joint pain, I might be able to use that knowledge to help our patients. I did a skeptic's search of the medical literature (Quick 1997),

and what I found was very intriguing. The people who complain about joint pain associated with bad weather are not restricted to areas with a lot of bad weather to complain about. The belief is also not restricted to any ethnic, cultural, or social group. Even medical doctors believe that the weather can affect joint pain (Hollander 1961, Patberg 1987), which is somewhat surprising because they can't explain why it happens.

Medical journals include many case reports of patients with symptoms that get worse when the weather changes. The most common medical conditions reported to be weather-sensitive are arthritis, lower back pain, and chronic muscle pain. In fact, the medical description for fibromyalgia (rheumatic muscle pain) includes weather-related pain as one of the diagnostic features (Yunus et al. 1981).

Who complains about pain when the weather changes?

60% of people with rheumatoid arthritis (inflammatory joint disease)

80% of people with osteoarthritis (degenerative joint disease)

80% of people with fibromyalgia (rheumatoid muscle pain)

others: low back pain, jaw pain, gout, amputees

Despite the widespread belief in weather-related pain, and its acceptance as a real phenomenon by the medical community, there is no scientific proof that such a thing really exists. It's not that nobody has tried, but the research done thus far is conflicting.

Some studies have found evidence that joint pain is worsened by certain changes in weather, but others have found that there is no effect, or the opposite effect. For example, some groups of researchers report that high barometric pressure causes more joint pain (Guedj and Weinberger 1990), but others claim that high pressure reduces joint pain (Jamison and Parris 1990). This calls into question which report is correct, why the other is incorrect, and whether there are underlying factors that had an effect but weren't considered in the research. More troubling still is that there can be conflicts within a single study, like one that found some patients who felt worse in high humidity while other patients felt better under the same conditions (Laborde et al. 1986).

What kinds of weather are associated with joint pain?

Cold **Rain**

Falling Barometer **Rising Humidity**

Overcast Skies

If weather can indeed influence joint pain, then you would expect that most of the research studies done so far (at least sixteen of them; see references) would pretty much agree with one another. But they don't—not even close.

This leads to the big question: If weather-related joint pain isn't real, why do so many people believe in it? One possible answer is that it's an unconscious psychological process shared by many people (Jamison et al. 1990, 1995). Detailed scrutiny of rheumatoid arthritis offers an example and a lesson.

People suffering from rheumatoid arthritis often have difficulty dealing with the disease psychologically (Affleck et al. 1987). The cause of the disease is unknown, there are no really effective treatments, and there is no cure. This makes it difficult for patients to understand why they are suffering. They ask, Why me? and there is no answer.

Symptoms of rheumatoid arthritis come and go, and the patient tries to pick out the circumstances that may have some effect. Some arthritics believe that their eating habits can influence the likelihood of joint pain. Others try to control their sleeping patterns because pain and stiffness are often worse when they wake up in the morning. Others may interpret morning stiffness as being related to morning coolness or dampness as a regular feature of the weather. Another reason why rheumatoid arthritics may focus on weather is that they know heat therapy can relieve the joint pain for a time, so they assume that cold weather should have the opposite effect.

Blaming their pain on the weather relieves the patient from thinking that he or she can control the episodes of pain by how they sleep, what they eat, and so on. They can't control the weather, so they feel no guilt when the pain comes.

Attitudes like these may develop unconsciously, so the linkage between pain and weather would seem like a simple cause-and-effect relationship. Furthermore, support groups for rheumatoid arthritis could reinforce these ideas if other patients were to express the same beliefs.

Almost all of the scientific studies of weather and joint pain have failed to rule out psychological effects. In fact, it's almost impossible to do. If a research subject believes that cold, for example, causes pain, then there is no way to expose that person to cold without him or her knowing it. And if the subject knows it's cold, that fact alone can trigger the psychological link with pain.

In another twist to the story, some people claim to actually be able to predict weather based on their joint pain (Jamison et al. 1995). To research this phenomenon, it is theoretically possible to eliminate the psychological bias. But to do so, the research subjects would have to be kept from watching television, listening to the radio, and reading newspapers so they

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Microclimate vs. Macroclimate

Macroclimate
is what the Weather Bureau reports

Microclimate
is what your skin experiences, which changes if

1) you are indoors or in a car
2) you wear clothes
3) you are exercising
4) you have gotten wet (e.g., from rain or swimming)
5) your skin has been treated with lotion (e.g., bug spray or sun block)
6) you stay in shady outdoor areas

wouldn't know about the official weather forecasts. They would also have to be kept from learning about the forecasts from other people. If they could then predict the weather in advance, it would prove that their joint pain was sensitive to changing weather conditions. However, this kind of experiment has never been done because it's just not practical to isolate human subjects for long periods.

Only one researcher thus far has succeeded in controlling the psychological element in studies of weather-related joint pain. Dr. J. L. Hollander, at the University of Pennsylvania, achieved this using a climate-controlled chamber, built in the early 1960s (Hollander 1961). In Hollander's experiments, patients with arthritis volunteered to live in the chamber for two weeks or more. The climate inside the chamber—temperature, humidity, atmospheric pressure, air flow, and air ionization—was completely controlled by the experimenter, and the change was made slowly so the occupants wouldn't notice. With this study design, the research subjects were unable to form a psychological link between changes in the weather and changes in how they felt.

In Hollander's experiments, the only weather condition that appeared to have any effect on joint pain was an increase in humidity occurring at the same time as a decrease in barometric pressure (Hollander and Yeostros 1963). This is precisely what happens in nature when a storm is approaching, and it fits well with the fact that many arthritics claim their joints hurt before a storm.

Hollander's work included only a dozen patients, so there is some suspicion that the positive results may have been a fluke—a matter of chance. Nevertheless, the experiment has never been repeated, despite the fact that three decades have passed and there is still no other proof that joint pain may be influenced by weather.

The bottom line in my review of the research literature is that medical science simply does not know whether atmospheric conditions can influence joint pain. People have been complaining of weather causing them pain since the time of Hippocrates, and that is not likely to change any time soon. Furthermore, if a person believes that cold or damp can cause joint pain, then the phenomenon is a *psychological* reality for that person, regardless of whether it is a *scientific* reality. I think it's reasonable to conclude that weather-related pain is not really a medical problem because flare-ups of pain are likely to occur (for unknown reasons) regardless of the weather. More important from my perspective is that it's not a viable medical opportunity because we don't really know the facts and therefore don't have a basis of scientific knowledge from which to build a treatment plan.

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