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NATIONAL DESK

Could It Be? Weather Has Nothing To Do With Your Arthritis Pain?

By GINA KOLATA (NYT) 1310 words

O.K. Maybe sugar does not make children hyperactive. Maybe getting cold and damp does not predispose people to catch a cold. Maybe there is even no such thing as the "hot hand" in basketball. But surely people with arthritis suffer more when the weather changes. Surely all those tales of old people who can feel a storm coming in their bones cannot be wrong?

Dr. Amos Tversky, a Stanford University psychologist (and the man who found a decade ago that the "hot hand," the notion that basketball players on a shooting streak were actually beating the laws of probability, was a myth), begs to differ. He has done a new study and reports that arthritis pain may have nothing to do with barometric pressure or dampness or humidity. Instead, he said, patients' enduring belief that their arthritis pain is related to the weather is caused by an innate human tendency to find patterns whether they are there or not.

It's what I do for a living: debugging human intuition," Dr. Tversky said. "If you take the broader view and look at people as intuitive scientists, you find that we are very good at pattern generation, we are very good at generating hypotheses. It's just that we are not very good at all at actually testing hypotheses." It is easy for humans to guess that an association exists. But testing and, if necessary, rejecting such associations tends to go against all our intuitions, he explained.

The conviction that joint pain ebbs and flows with the weather dates to Hippocrates in 400 B.C., Dr. Tversky said. But the medical literature on arthritis pain and weather is conflicting and confused, the researchers found. Studies that objectively measured inflammation found no associations with weather patterns.

Studies that used subjective measures of pain sometimes found associations and sometimes did not. Some investigators found that pain increased when barometric pressure increased, but others found that pain decreased when barometer readings rose. Some found that pain occurred only when both barometric pressure and humidity changed, but others found no such correlation. Some studies found that weather affected arthritis pain immediately, but others said it took a few days for the effects of weather to show up.

So Dr. Tversky and a colleague, Dr. Donald A. Redelmeier, an internist at the University of Toronto, conducted their own study, which is published in the current issue of Proceedings of the National Academy of Sciences. They recruited 18 patients with arthritis and followed them for 15 months, assessing pain as reported by the patients; joint tenderness, as determined by a doctor, and the patients' functional status, the ability to get along in daily life, as measured by a standard test. They also obtained local weather reports on temperature, barometric pressure and humidity.

All but one of the patients were convinced that their arthritis pain varied with the weather and all but two said that it was a powerful effect, occurring within a day of a weather change and that the relevant variables were barometric pressure, temperature or humidity.

But the researchers found no correlation between the patients' symptoms and the weather, no matter what aspect of weather they looked at. They even considered nine different time lags, from two days before to two days after a patient reported pain, but the weather simply was not related to pain, they found.

The best explanation, Dr. Tversky said, is that the human brain is designed to look for patterns, even if, statistically, patterns do not exist. Dr. Tversky said he could understand why people might attribute arthritis pain to the weather. "If your joints ache, you look for a reason," he said. "If it's not rain, it's barometric pressure. If it's not barometric pressure, it's humidity." Dr. Redelmeier said that "the longer you live with arthritis, if anything the greater your degree of confidence" that weather influences your pain.

Dr. Persi Diaconis, a professor of mathematics at Harvard University, said that even as a scientist who studied the laws of probability, he found himself seeing patterns in random data. "We all know how easy it is to do this," he said. In fact, he said, laboratory research has shown that people tend to make up elaborate rules to explain what are actually random events.

One such experiment involved two lights in a room. One would be flipped on and the other flipped off in a randomly generated sequence that forced the light on the left to be turned on 70 percent of the time and the one on the right to be flipped on 30 percent of the time.

Volunteers were paid every time they correctly guessed which light would turn on next. Of course, Dr. Diaconis said, since there was no pattern, the best strategy would be to guess the left light every time; then you would be right 70 percent of the time. Instead, he said, people made up their own elaborate rules, like: after two lefts it is a right except after five times the left light goes on twice in a row. "Dumb creatures like goldfish actually do better than people," Dr. Diaconis said.

Dr. Tversky and Dr. Redelmeier did a small experiment along the same lines. They generated sequences of random numbers and labeled one sequence "arthritis pain" and the other "barometric pressure." They then asked 97 college students if they saw evidence in the data that pain was correlated with barometric pressure. They did, finding patterns where there were none.

When it comes to real arthritis pain, Dr. Tversky and Dr. Redelmeier may have some trouble getting their point across. Dr. Michael Lockshin, a rheumatologist at the National Institutes of Health in Bethesda, Md., said most patients were already convinced of the relationship and often asked their doctors if they should move to a place like Arizona. Many doctors also believe that the relationship with weather is real, he said. In fact, he said, in studies in the 1960's, researchers tried and failed to find evidence that joints became more inflamed when the weather changed. So they decided that

barometric pressure changes made patients feel more pain, even if their joints were no more inflamed.

Dr. Frank Arnett, a rheumatologist at the University of Texas at Houston, said that he himself remained convinced that the weather influenced arthritis pain.

"It goes well beyond arthritis," Dr. Arnett said. "Actually, anyone who has any disorder of the musculoskeletal system tends to notice pain when the weather changes. Even someone who had a fracture and it heals complains that they can tell when the weather is going to change. My wife had that and she doesn't imagine things. I would find it hard to disregard a notion we had for centuries."

Dr. Redelmeier said he would not argue with patients who were convinced of the weather's influence on arthritis pain.

"My job as a physician is to listen to patients and get rid of their pain," he said. He finds it can do more harm than good to "confront people about their beliefs and try to force them to change their minds."

Dr. Tversky added that he knew from experience that such arguments often fell on deaf ears. As fascinated as he was to find that the hot hand in basketball was a myth, he discovered that no one wanted to hear it and that most people still believed in the phenomenon.

"I've lost many good friends over it," Dr. Tversky said.

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