SCIENCE NEWS of the week

# Does Vasectomy Cause Prostate Cancer?

As a method of birth control, vasectomy already suffers from an image problem. Now, two scientific reports suggest a link between vasectomy and a heightened risk of cancer of the prostate, a male sex gland.

Various studies have raised concerns about the safety of vasectomy, an operation that prevents the release of sperm during ejaculation. For example, in December 1990, two separate scientific teams reported an association between prostate cancer and vasectomy (SN: 1/12/91, p.29). However, a number of other studies discounted a health risk.

Edward Giovannucci of the Harvard Medical School in Boston and his colleagues decided to investigate the prostate cancer and vasectomy question by conducting two studies that include data collected from more than 73,000 men. Both revealed a statistically significant link between vasectomy and prostate cancer. "It is a potentially important risk because prostate cancer is a relatively common disease," Giovannucci says.

In the first study, the team collected information from male dentists, veterinarians, and other health-related professionals. The researchers mailed a questionnaire to the participants in 1986 asking them about their age, diet, and whether they had had a vasectomy. Then, the researchers periodically asked the men whether they had been diagnosed with prostate cancer. Between 1986 and 1990, 300 of the men developed prostate cancer.

A statistical analysis showed that men who underwent a vasectomy had a 66 percent greater risk of prostate cancer than men who had never undergone the procedure. That elevated risk remained even when the researchers considered each man's diet and other factors thought to influence the risk of prostate cancer.

In the second study, the team focused on the husbands of nurses participating in the Nurses' Health Study. The researchers asked whether the men had obtained a vasectomy and then kept track of new cases of prostate cancer. Between 1976 and 1989, the team found 96 new cases of the malignancy. This study found a similar risk: Husbands with a vasectomy had a 56 percent greater risk of developing prostate cancer than their peers.

Both studies found that men who had undergone vasectomy more than two decades ago faced the greatest threat of prostate cancer.

The researchers detail their findings in the Feb. 17 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

The data from the two studies add weight to the argument that some cases of prostate cancer may be caused by vasectomy, Giovannucci says. Yet the new findings do not prove a cause-and-effect relationship. Indeed, Stuart S. Howards, a urologist at the University of Virginia Health Sciences Center in Charlottesville, cautions against jumping to the conclusion that vasectomy is one cause of prostate cancer.

The link between prostate cancer and vasectomy may represent a bias in the study sample, argues Howards, who together with Herbert B. Peterson of the Centers for Disease Control and Prevention in Atlanta wrote an editorial that appears in the same issue of the journal. Men who opt for a vasectomy may have other risk factors that predispose them to prostate cancer, Howards says.

What's a man to do? "Right now, I think it's important to emphasize that men who have had a vasectomy should not panic," says H. Logan Holtgrewe, president of the American Urological Association (AUA). Peterson agrees, saying, "The data are far too preliminary to consider vasectomy reversal."

The AUA recommends that middle-aged men who have had a vasectomy consider having an annual rectal exam and a test that measures a blood protein called prostate-specific antigen (PSA). Both procedures help physicians detect prostate cancer.

The new findings certainly don't rule out vasectomy for men who are considering the procedure. "All methods of contraception carry some risk," Howards and Peterson note, adding that men should be informed of the new findings in order to make an informed decision.

*— K.A. Fackelmann*

## Baseball pitchers hurl illusions home

With major league baseball season fast approaching, you can bet that two types of pitches will drive batters batty. One, dubbed the "rising fastball," rockets toward the hitter, only to jump a few inches to a foot upon reaching home plate, wickedly hopping over the outstretched bat. The other, a "breaking curveball," loops toward the batter and at the last moment plunges downward.

Although baseball players have long groused about these pitches, the rising fastball and breaking curveball do not actually exist, according to a study conducted by two engineers. Instead, the hops and dips are visual illusions produced when a batter errantly estimates the speed of a pitch and momentarily shifts his gaze as the ball travels to home plate, contend A. Terry Bahill of the University of Arizona in Tucson and William J. Karnavas of the University of Pittsburgh Medical School.

In experiments directed by Bahill nearly a decade ago, baseball players displayed an inability to track a pitch continuously as it approached them. Measures of eye movements revealed that often hitters momentarily divert their eyes to where they think the ball will cross home plate.

Michael K. McBeath, a psychologist at Kent (Ohio) State University, proposed in 1990 that a perceptual illusion accounts for the rising fastball. A baseball leaves a pitcher's hand about 6 feet above the ground; it would have to arc down and bounce up to qualify as a rising fastball, thus defying gravity. Instead, McBeath argued, if a batter underestimates the initial speed of a fastball, it appears slightly farther away and slightly lower than its actual location. At home plate, the horsehide appears to accelerate upward with a hop.

Bahill and Karnavas devised a mathematical model based on this theory and tested it in a computer simulation. By accounting for the actual speed of a fastball, the batter's underestimation of that speed, and the batter's eye shift to a predicted point ahead of the ball, the model found that the batter perceived the ball as falling faster than it really was and approaching a point lower than its actual height.

The breaking curveball model included the same elements but relied on an overestimation of pitch speed by the batter. In this case, the batter tracked the ball on a mistakenly elevated trajectory, and the ball reached the plate at a lower point than expected.

Ball players might improve their pitch-speed judgments by consulting a radar gun during batting practice, the scientists suggest in the February JOURNAL OF EXPERIMENTAL PSYCHOLOGY: HUMAN PERCEPTION AND PERFORMANCE.

A competing mathematical model of the same pitches, devised by psychologist Reinoud J. Bootsma of the University of Marseille in France, assumes a batter tracks a ball based on estimates of its size and acceleration. This approach best accounts for studies in which people thrown an unexpectedly small ball mistakenly think it will reach them at a point higher than it actually does, Bootsma argues. *— B. Bower*