Spermicides may not offer HIV protection

Risky sex just got riskier. A new study suggests that a common spermicide offers no protection against the AIDS virus (HIV).

Previous human trials had suggested that spermicide use helped ward off infection with disease-causing microbes such as *Neisseria gonorrhoeae*. Many researchers jumped to the conclusion that spermicides also offered a shield against HIV because nonoxynol 9, the active ingredient in most spermicides, kills HIV in the test tube.

Right now, the male condom represents the most reliable method (short of abstinence) of avoiding infection with sexually transmitted microbes. However, studies show that a number of men will not use this method. Some public health experts therefore recommend that women whose partners won't use condoms turn to spermicidal methods, such as a vaginal sponge that contains nonoxynol 9.

A new study suggests that such advice may prove premature. Joan Kreiss of the University of Washington in Seattle and her colleagues studied 138 prostitutes in Nairobi, Kenya, who tested negative for HIV infection at the study's start. The team randomly assigned 74 of the women to a group instructed to wear a sponge impregnated with nonoxynol 9. The remaining 64 used a placebo cream or suppository during sexual encounters. In addition, the researchers stressed to all women the importance of getting their partners to use condoms.

For more than a year, the research team followed these women, asking them to return to the clinic for periodic visits. During that time, 14 women in the nonoxynol 9 group and eight women in the placebo group dropped out of the study, leaving a total of 60 in the sponge group and 56 in the placebo group.

When the team analyzed their data, they found that the two groups were similar with respect to age and percentage of sex partners who used condoms.

Prostitutes using the nonoxynol 9 sponge reduced their risk of *N. gonorrhoeae* infection by 60 percent, a finding that confirms previous data. However, the sponge failed as a guard against HIV.

"We were unable to demonstrate that nonoxynol 9 sponge use was effective in reducing the risk of HIV infection among highly exposed women," the authors report in the July 22/29 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. Their findings were also presented during a briefing at the VIII International Conference on AIDS in Amsterdam last week. The team discovered that 27 of the 60 women (45 percent) in the sponge group and 20 of the 56 women (36 percent) in the placebo group developed HIV antibodies during the course of the study.

In addition, sponge users had an increased risk of genital ulcers, a finding that suggests the sponges may actually increase the risk of HIV transmission, comments Katherine M. Stone, an epidemiologist at the Centers for Disease Control in Atlanta. Stone, who wrote an editorial accompanying the report, wonders whether the study's findings can be applied to women who are at lower risk of HIV infection. "The bottom line is the jury is still out on spermicides and HIV," Stone says. *– K.A. Fackelmann*

GABA receptor linked to absence seizures

A new animal study offers hope of better treatment for so-called "absence" seizures in humans.

Also known as petit mal, this form of epilepsy occurs mainly in children and is marked by seconds-long lapses in consciousness. A child can experience up to 100 episodes a day, during which he or she may seem to stare, often blinking rapidly, or sway slightly before recovering. Frequent seizures can interfere with concentration and lead to problems in school. Fortunately, seizure frequency tends to decline with time; four-fifths of all affected children outgrow absence seizures by age 20.

New findings suggest that these seizures result from an overabundance of receptors for a brain chemical called gamma-aminobutyric acid$_B$ ($GABA_B$), according to neurologist David A. Hosford and his colleagues at the Duke University Medical Center and the Veterans Administration Medical Center in Durham, N.C. They describe their work in the July 17 SCIENCE.

This study represents "a major advance . . . the first step in designing new therapies" for absence seizures, says Robert J. DeLorenzo, a neurologist with the Medical College of Virginia at Virginia Commonwealth University in Richmond.

The anticonvulsant drugs currently used to suppress absence seizures often cause drowsiness, and can effectively treat only about 80 percent of the approximately 100,000 U.S. children affected by these seizures, Hosford says.

In their study, the Durham researchers determined that specially bred, epilepsy-prone mice, called lethargic mice, have seizures that closely resemble absence seizures in humans. During the seizures, the brains of these mice produced electrical signals similar to those seen in humans experiencing absence seizures. The mice also responded to the same anticonvulsant drugs used to treat people with absence seizures.

Hosford's team then used the lethargic mice to test a theory, proposed last year by researchers in England, linking absence seizures to the actions of $GABA_B$ receptors, which help transmit signals from one nerve cell to another. The Durham scientists found that the activity of these receptors directly influenced seizure frequency: Compounds designed to block the activity of $GABA_B$ receptors greatly decreased the number of seizures in the lethargic mice, while a compound designed to enhance the activity of $GABA_B$ receptors increased the number of seizures.

Close examination of tissue samples revealed that the brains of the lethargic mice contained 26 percent more $GABA_B$ receptors than the brains of normal mice. Electrical tests confirmed that overall $GABA_B$ receptor activity was greater in the epileptic mice.

Hosford hopes that such research will "lead to a more tailored therapy designed to attack the mechanism of petit mal and perhaps treat the seizures without producing some of the more unfortunate side effects" caused by current drugs. *– K. Hoppe*

Magnetic activity: A flare for research

Like giant accelerators in the sky, the arching magnetic fields that pierce the upper atmosphere of stars can unleash vast amounts of energy. Colliding, breaking apart, and reconnecting, the fields accelerate charged particles high in the atmosphere, triggering an explosive brightening, or flare, near the visible surface of the star below. New observations of the sun and of a nearby Milky Way star reveal the profound role that magnetic fields and protons play during a flare – and in its high-energy afterglow.

For years, researchers have speculated about how magnetic energy released in a star's upper atmosphere, or corona, heats the lower depths, where visible-light flares occur. Some scientists proposed that beams of electrons in the corona, excited by the magnetic fields, rain down on the star and carry the energy. Others suggested that proton beams could transport the energy more efficiently.

In 1976, two U.S. astronomers predicted that if downward-moving proton beams were indeed the carriers, these particles would collide with hydrogen atoms to produce a brief but telltale type of ultraviolet radiation. At a press conference last week, researchers announced that the Hubble Space Telescope had detected such radiation from a Milky Way flare star called AU Microscopium.

Located 30 light-years from Earth, this