Chlamydia detection and (maybe) protection

Even its victims may never have heard of it, but *Chlamydia trachomatis* is the most common sexually transmitted disease agent in the United States. It is also one of the most damaging. The severity of the problem has prompted guidelines for its detection, published in the April 4 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, as well as investigations into possible defenses against infection. A report at the recent meeting of the American Society of Microbiologists (ASM) confirms that, in the laboratory, an ingredient in most spermicides prevents chlamydial infection of cells.

The problem with detecting chlamydia is that it is often painless: Asymptomatic in up to 70 percent of the women it infects, it can cause infertility before infection is discovered. "Ideally, you'd like to do universal screening," says researcher H. Hunter Handsfield of the Seattle-King County Department of Public Health, who helped formulate the detection guidelines. But until recently, the only dependable test for chlamydia was expensive, difficult and largely unavailable outside of major medical centers. New immunologic tests that detect the *Chlamydia trachomatis* bacteria in genital secretions (SN: 5/7/83, p. 296) are better suited to clinic use, but the cost of the tests is still a stumbling block – especially, Handsfield and his colleagues note, "in public clinics that serve the populations at highest risk."

In a study of 1,059 women at two family-planning clinics, the researchers found that five characteristics could identify women likely to be infected with chlamydia. The characteristics: no more than 24 years old; having had a new sex partner within the preceding two months; having a purulent cervical discharge; bleeding during parts of the vaginal exam; and using a nonbarrier method of contraception, or no contraception at all. Testing any woman with two or more of these risk factors, they say, would have caught 90 percent of the chlamydial infections at the clinics while reducing the number of women tested by 35 percent.

"What we've shown is if you narrow the net any more than that, you're going to miss a lot of cases," says Handsfield. "Chlamydia infections cross social lines, and a lot of people who don't appear to be at risk . . . really are."

Chlamydial infection can be effectively treated with antibiotics. But protected by the dificulty of detection, the bacteria have apparently spread at increasing rates over the last decade, according to the Centers for Disease Control in Atlanta; there are now more than 4.5 million new cases of chlamydia each year. The bacteria cause urethritis and other infections in men, whose infection can also be asymptomatic. In women, chlamydia-caused pelvic inflammatory disease can scar fallopian tubes and result in infertility or ectopic pregnancy. Babies born to infected women can develop eye infections and pneumonia.

But some good news: At the recent ASM meeting came confirmation of last year's reports that nonoxynol-9, the active ingredient in most spermicides and in a commercially available contraceptive sponge, has an anti-chlamydial effect in mouse cells *in vitro*. Researcher P. Blakeney Wyrick of the University of North Carolina at Chapel Hill adds a word of warning to her team's results: If an infected woman uses spermicide shortly before a test for chlamydia, the lack of bacteria in the vaginal canal could lead to a false negative diagnosis.

According to Michael Rosenberg at Family Health International in Research Triangle Park, N.C., early clinical trials are bearing out *in vitro* research. In women at high risk of infection, he told SCIENCE NEWS, "75 percent of infections, roughly, are prevented by use of the [contraceptive] sponge." – *L. Davis*

Alerting immunity, hand in glove

One of the more elegant methods of immunologic tinkering involves manipulating a molecule with the inelegant name anti-idiotypic antibody. The process, based on principles laid out by Nobel Prize winner Niels K. Jerne, is a way of activating the immune system to attack things it has been ignoring but that don't belong in the body.

Two recent reports detail advances in learning how to use anti-idiotypic antibodies to fight viral diseases and cancer. In one, Wistar Institute researchers in Philadelphia induced mice to produce antibodies to human cancer cells. The second report, from the Southwest Foundation for Biomedical Research in San Antonio, Tex., showed that an anti-idiotypic antibody against hepatitis B protected chimps from the disease.

Both experiments relied on Jerne's network hypothesis – the idea that the immune system is preprogrammed to be activated by idiotypes, portions of antibodies that control their specificity. Idiotypes can provoke anti-idiotypes, which in turn can provoke anti-anti-idiotypes that attach to the initial provoker as well as to the anti-idiotype.

The idiotype recognizes portions of disease organisms or cancer cells that can be thought of as sticking out from those objects like hands. Idiotype-containing "gloves," or antibodies, fit the foreign substance. The researchers in both studies injected these antibodies into animals, which then made second antibodies, or anti-idiotypes, that fit into the gloves like the original hands. The second antibodies were then used to induce a third antibody, the anti-anti-idiotype.

Earlier work had hinted at the ability of these third antibodies to fight cancer (SN: 4/6/85, p. 213). Wistar researchers Dorothee Herlyn, Alonzo H. Ross and Hilary Koprowski started with an antibody (the glove) to antigens on human cancer cells (the hand) and injected it into goats. The goats made antibodies to the antibody, and these were used to immunize rabbits and mice. Both groups of animals produced "glove-shaped" antibodies – technically, anti-anti-idiotype antibodies – that bound not only to the goat antibody but also to the original human cancer cells, they report in the April 4 SCIENCE.

The point of using the second antibody, Herlyn told SCIENCE NEWS, is to present the image of the foreign substance in such a way that the body will react to it whereas it didn't react to the initial "hand." In addition, the immunizing antibody is easier to produce than tumor proteins and may also be safer, she says.

The researchers thought of using anti-idiotypes because of a peculiar result in cancer treatment trials at Stanford University in which antibodies against blood cell cancers were used (SN: 8/22/81, p. 117). In some cases, the body began reacting against the cancer long after the injected antibodies were gone. Clinical trials of anti-idiotype vaccines have begun in Europe and are just beginning at Wistar, Herlyn says.

Anti-idiotype vaccines against bacteria and viruses have already proved useful in mouse and rat trials. In the April 11 SCIENCE, Ronald C. Kennedy, Gordon R. Dreesman and their colleagues describe successful testing in chimpanzees of an anti-idiotypic vaccine against hepatitis B virus.

They generated their vaccine by injecting rabbits with human antibodies to hepatitis B; the resulting rabbit antibodies were then injected into two chimpanzees, both of which developed immunity. "What this says is that anti-idiotypes do represent a feasible candidate for [preventing] human disease," says Kennedy.

One advantage of anti-idiotypic vaccines is that unlike conventional vaccines they do not contain any viral components that could potentiallly induce disease. In addition, Kennedy says, studies of anti-idiotype vaccines in mouse and rat systems indicate they may be able to provoke immunity in newborns, something many conventional vaccines can't do. Kennedy's group is also looking at possible anti-idiotypic vaccines against AIDS. – *J. Silberner*