

## Search for a Preparation to Prevent Venereal Disease and Pregnancy

Sexual intercourse can result in pregnancy, venereal disease, or both conditions. Would one of the intravaginal contraceptive preparations that have been accepted and used for some time to prevent pregnancy avert both pregnancy and venereal disease? Might such a preparation be enhanced by the addition of some suitable substance?

The older prophylaxis was directed at protecting only the male. Also, except for the condom, which provides only limited protection for both sexes, the older methods were applied after the sexual act.

An ideal venereal disease prophylactic should protect both the man and woman from venereal disease and at the same time prevent conception. It would be applied before the sexual act. The preparation should be readily available in a single-dose disposable unit that a woman could carry unobtrusively in her purse or a man, in his pocket. The unit should be simple, practical, and inexpensive. A pro-con (prophylactic-contraceptive) intravaginal preparation, we believed, might fulfill these requirements and offer some hope of reducing the mounting rates of unwanted pregnancy and disease.

In the search for a preparation that would simultaneously prevent disease and pregnancy, we first tested nine commercially available contraceptives to see if any of them would kill the treponemes causing syphilis immediately upon contact. A slow acting chemical agent may not be effective if the *Treponema pallidum* penetrates the genital mucosa. We studied the organism causing syphilis first, rather than the gonococcus, because there are standard methods for in vivo, as well as in vitro, tests of *T. pallidum*.

A darkfield preparation was made by placing a drop of an emulsion of *T. pallidum* on a glass slide and adding a similar sized drop of the substance to be studied. Within a few seconds, the slide was placed under the microscope and studied for motility of the organisms. The contraceptive gels mixed more quickly than the contraceptive creams with the emulsion of treponemes. With the gels, the width of the zone of immobile organisms varied at the interface, depending on the contraceptive preparation and how well it was mixed with the emulsion of treponemes. While the creams mixed less rapidly,

they killed the treponemes at the interface with zonal effects. The treponemicidal effect of all compounds could be increased on the slide by stirring the mixture of treponemes and contraceptive substances.

Aqueous 1 to 10 and 1 to 100 concentrations of the contraceptive preparations were tested in dark-field studies. The treponemicidal effect varied with the contraceptive compound and with the dilutions. When the dilutions were 1 to 100, few organisms were killed. Some of the 1 to 10 dilutions, however, immobilized all treponemes upon contact.

The treponemicidal effect may have been due to a combination of the contraceptive chemicals or to the pH; our studies were not definitive as to the specific immobilizing agent. Many chemical solutions have been shown to be treponemicidal in vitro that are not effective in preventing syphilis when tested in the live rabbit (1). The next step, therefore, should be the testing of selected contraceptives in the live male rabbit after the genital mucosa has been exposed to an emulsion of *T. pallidum* for 1 hour and treated with an application of the pro-con preparation. If syphilis is prevented in the rabbit, a substantive step will have been taken toward development of a pro-con for man.

Tests of the ability of the contraceptives to prevent growth of the gonococcus in vitro should be done simultaneously. There is no economically suitable laboratory animal for practical in vivo studies of the gonococcus, but in vitro studies will give the necessary leads to follow.

Preliminary studies indicate that the concept of a pro-con has a distinct possibility of realization. Research is needed to determine if the contraceptive preparations currently available can be made more effective in prophylaxis and contraception.—R. C. Arnold, M.D., medical director, Missouri Crippled Children's Service, Columbia, and J. C. Cutler, M.D., director, Population Division, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pa.

### REFERENCE

- (1) Arnold, R. C., and Cutler, J. C.: Experimental studies to develop local prophylactic agents against syphilis. *Brit J Vener Dis* 32: 34, March 1956.