

Prostaglandins and heavy menstrual flow

A type of prostaglandin, one of the group of compounds that have been implicated in menstrual cramps, may also be the cause of heavier than normal menstrual bleeding, according to a report in the March 7 *LANCET*. This finding suggests that prostaglandin-inhibiting drugs, several of which are currently available by prescription, might prevent excessive menstrual flow just as they do cramps (SN: 11/15/80, p. 312).

Prostaglandins are hormone-like substances that have been found to cause muscle contractions, to control constriction and dilation of blood vessels and to be of particular importance in a variety of reproductive mechanisms. While the regulation of menstrual bleeding is poorly understood, several studies have suggested that prostaglandins might be implicated. In the *LANCET* study, S. K. Smith and co-workers from the University of Edinburgh, Scotland, note that prostacyclin, a prostaglandin that causes blood vessels to dilate and prevents blood platelets from aggregating, is produced when cells from the mucous lining of the uterus (the endometrium) and from the muscle lining of the

uterus (the myometrium) are combined in a laboratory culture and exposed to the prostaglandin precursor arachidonic acid. Because this suggests that the uterus may have the ability to produce prostacyclin, which may in turn increase menstrual bleeding, the researchers compared the prostacyclin-producing ability of the endometrial cells of women with normal menstrual flows and those of women with heavy flows.

The researchers took endometrium samples from seven women with regular and normal menstrual flows and from six women with regular but heavy flows. These cells were incubated with myometrial cells obtained from a single source and the cultures were exposed to arachidonic acid. Prostacyclin itself was not produced, but the production of an intermediate compound in its synthesis was found to be three times higher in the cell cultures from heavily bleeding women than in those from women with normal flows. The researchers suggest that some abnormality in the endometrium of women who have heavy flows acts on the myometrium, which contains the enzymes necessary to synthesize prostacyclin. The blood vessel dilation and anti-platelet aggregation properties of the prostacyclin in turn "may be responsible for the heavy and prolonged bleeding." □

Erasing stress signs with a tranquilizer

Minor tranquilizers may do more than simply lower general levels of arousal. Clinical results reported in the April 3 *SCIENCE* indicate that one such tranquilizer, meprobamate, reduces specific physiological responses to disturbing events. William M. Waid, Emily C. Orne, Mary R. Cook and Martin T. Orne base this conclusion on a study of 44 male college students at the University of Pennsylvania. The students memorized a word list and then took a polygraph, or lie detector, test. Thirty-three of the students were told to lie when asked about the words, and 11 were instructed to tell the truth. The "guilty" men were divided into three groups: One took a 400-milligram dose of meprobamate, another took a placebo and the third received nothing. Men in the first two groups were told they were being given a tranquilizer to help them beat the test. Polygraph examiners were able to pick out 77 percent of the "guilty" subjects from the placebo and no drug groups. But their accuracy plummeted to 27 percent for the tranquilized group. The examiners also had difficulty in judging which subjects had received a tranquilizer. This may have been due to the lack of baseline data on subjects and to the short period of observation — problems polygraph testers in the field encounter often. But some studies suggest that normal doses of tranquilizers cause no obvious impairments in behavior or performance. Despite this un-

certainty, the researchers say that the results were not due to a total lack of responsiveness in the tranquilized men, but to a lack of heightened response while lying. They add that meprobamate may be ineffective in an actual lie-detector laboratory where fear of detection is usually much greater than in an experimental situation. Also, the more intrusive type of questioning practiced by field examiners might aid in seeing through the masking effects of a tranquilizer. But the investigators note that 400-milligram doses of meprobamate are effective in reducing the anxiety of psychiatric patients, and this may generalize to a "normal" population. Substantially higher doses could be used unobtrusively to deceive a field test.

While these findings support doctors' observations that tranquilizers such as meprobamate selectively reduce physiological responses to disturbing events, the validity and reliability of the polygraph test remain the focal points of considerable controversy. Along with reservations about the invasion of privacy, critics question whether the test can uncover habitual liars and assert that it measures several emotions, not just those associated with deception. Polygraph researchers say the test has been shown reliable and accurate. Valid or not, polygraphs are used in most criminal investigations and for pre-employment screening and monitoring of internal theft in many companies. □

Drug treatment shrinks tumor

Pituitary tumors that produce excess hormone are surprisingly common. Autopsies on persons who have died of other causes indicate that tumors producing the hormone prolactin, for instance, may be present (although not necessarily harmful) in one in ten persons, Michael O. Thorner of the University of Virginia School of Medicine told a seminar in New York sponsored by the Endocrine Society. In some cases these prolactin-producing tumors cause menstrual disorders, inappropriate milk release, infertility, impotence, and eventually vision problems and headaches. Now a drug used clinically to reduce abnormal levels of prolactin in the blood has been found to shrink the tumors. "This is one of the first human tumors that can reliably be treated by a drug not a cytotoxic drug [one that kills cells]," Thorner says.

Pituitary tumors are the most common cause of high levels of prolactin, generally detected in women with menstrual disorders or infertility. Although autopsy data show no difference between men and women in the frequency of pituitary tumors, high levels of prolactin are diagnosed ten times more frequently in women than in men. High prolactin levels impair sexual function in men, but the change is so gradual that men seldom mention it to their physicians. Disturbances of vision and headaches usually cause men with prolactin-producing pituitary tumors to seek medical treatment. Because the pituitary is located just beneath the junction of the optic tracts in the brain, if a tumor grows so large that it expands beyond the pituitary's bone cavity and presses against the brain, it can cause blurred vision, loss of peripheral vision and throbbing headache.

Surgery has been used on patients with pituitary tumors, but only those with small tumors can be cured reliably, Thorner says. Even after surgery, patients with large pituitary tumors have elevated prolactin levels. In contrast, the drug bromocriptine lowers prolactin levels by mimicking dopamine, a natural inhibitor of prolactin release. Bromocriptine is currently prescribed only for short-term treatment of women with abnormal absence of menstruation, inappropriate milk release and no evidence of pituitary tumor. But Thorner says that in addition to lowering prolactin levels, even in patients with tumors, the drug appears to cause a marked reduction in the tumor volume. These results, along with the concomitant restoration of menstruation, fertility and other gonadal functions, only last as long as the drug therapy is continued. High prolactin levels, increased pituitary volume and their symptoms recur when the patient stops taking the medication.