The split personality of endorphins

That the natural opiate, beta-endorphin — referred to by one scientist as a major element in the brain's "good feeling machine" — is inexorably involved in human emotions is now generally accepted. The full nature and extent of this involvement, however, remains mysterious. Because of the peptide's opiate-like qualities, it has been suggested that severe depression may logically result from a deficiency in brain endorphin levels. But preliminary studies by New York researcher Nathan S. Kline have shown that while beta-endorphin injections elevate the mood of depressed persons, the improvement is short-lived. Moreover, Kline found much longer-lasting improvements after administering the compound to schizophrenics, whose problems have been linked more to other brain chemicals than to endorphins (SN: 11/11/80, p. 326).

Beta-endorphin's role in the brain, as well as Kline's somewhat puzzling results, may be clearer now, following the publication of two studies in the June ARCHIVES OF GENERAL PSYCHIATRY. In the first experiment, 10 depressed and eight schizophrenic patients received beta-endorphin injections or a placebo at various times. (A major criticism of Kline's work is that it did not utilize a placebo or control subjects.)

In their study, researchers at the University of California at Los Angeles and UC San Francisco used the ratings of physicians and nurses and the self ratings of patients to assess behavioral changes after the injections. Their results in treating depression concurred with those of Kline — depressed patients improved significantly for several hours after beta-endorphin injection as opposed to placebo injections. But among the schizophrenics, the researchers reported not only "no significant change," but that "six of eight worsened after beta-endorphin treatment."

And in a separate double-blind experiment with nine chronic schizophrenics, scientists at Stanford, the University of Michigan, UCLA and UCSF report that while there appeared to be some improvement at a statistical level following a single injection, there was no "clinically obvious improvement in schizophrenic symptoms."

Researchers in the first study (involving both depressed and schizophrenic patients) say their use of a double-blind, placebo procedure and "standardized behavioral ratings" may account, along with other factors, for the discrepancy between their results with schizophrenics and those previously reported. They suggest the worsening of schizophrenic symptoms after injection may occur because beta-endorphin could trigger an increase in dopamine, a brain transmitting chemical whose overabundance has been linked to schizophrenia.

The success, albeit limited, across all three studies in treating depression, however, "suggests a unitary endorphin hypothesis of affective disorders in which depressed patients have a deficit in endorphin activity while manic patients might have an excess," say the researchers —Robert H. Gerner, Don H. Catlin, David A. Gorelick and Ka Kit Hui of UCLA and Cho Hao Li of UCSF. But they add that assumption may be "oversimplistic" — "We think it more likely that the actual relationship of endorphin opioids to mental illnes is complex and multidimensional," they say. Depression-triggering problems might include the synthesis of abnormal endorphins, imbalance of several types of endorphins or endorphin action on other neurochemicals such as dopamine or serotonin. Finally, they suggest that more sustained improvements in depression might be fostered by multiple, rather than single, doses of beta-endorphin — a possibility made more realistic by the recent production of beta-endorphin by genetically engineered bacteria (SN: 5/17/80, p. 309). □

New vaccines against rabies

Two safer, more effective and less painful vaccines against rabies have been announced. One — produced from viruses grown in cultures of human cells — has been approved by the Food and Drug Administration. The other — a modification of the prevalent duck egg technique — is still in clinical tests.

The vaccine just approved by the FDA is injected into the patient's arm instead of into the abdomen, and five injections, rather than 23, provide immunity. Most patients who receive the older treatment have considerable pain, itching and swelling, but only a quarter of the patients who have received the new vaccine exhibited local reactions.

Virus for the new vaccine is grown in cultures of human fetal lung cells and is inactivated before use. Because the technique does not involve duck eggs, the product contains no embryonic duck protein and will not provoke an allergic reaction in people sensitive to eggs.

The new vaccine is being made by the Institut Merieux in Lyon, France, and is expected to become available soon. It is administered along with a blood plasma product (rabies immune globulin) that provides temporary protection. In studies in Germany and Iran, 76 persons were given the vaccine after being bitten by rabid animals. None developed rabies.

The new vaccine can also be used to protect people likely to be exposed to rabid animals or to rabies virus. Pre-exposure immunization consists of three inoculations. Then if the person is exposed, two more shots are given.

Other research, aimed at improving the duck embryo vaccine, was reported at the recent meeting in Miami Beach of the American Society for Microbiology. Klaus R. Schell described a highly purified and concentrated vaccine from which more than 96 percent of the duck protein had been removed. In work at the Swiss Serum and Vaccine Institute in Berne, Switzerland, more than 300 doses of the purified vaccine have been administered to volunteers. Fewer than 3 percent of the recipients exhibited local reddening, swelling or heat lasting more than 24 hours. Because the vaccine is more concentrated than the current duck embryo vaccine it, like the cell-culture vaccine, can probably be given in a much shorter series of inoculations and is expected to provoke fewer allergic reactions.

According to the FDA, thousands of persons each year receive rabies vaccine after being bitten by a dog or other animal. These who do not get the vaccine and who develop rabies almost never survive. □

Prematurity preventive

The reason that thousands of infants in the United States are born prematurely each year and thus are especially vulnerable to death, respiratory distress and other medical complications is that sedatives, muscle relaxants and other drugs used to prevent premature labor haven't been very successful. Now a drug that can more effectively prevent premature delivery has been approved by the U.S. Food and Drug Administration.

The drug is ritodrine hydrochloride and will be marketed under the brand name Yutopar by Merrell-National Laboratories in Cincinnati. "We consider ritodrine an important drug in that it promises to have an impact on a serious public health problem," says FDA Commissioner Jere E. Goyan.

In clinical studies of women experiencing premature labor, ritodrine prolonged pregnancy and increased the proportion of babies weighing 5 lbs. 8 oz. or more at birth — the weight at which babies are no longer considered premature — in more than half the cases. These studies also showed that deaths among newborns whose mothers had been treated with ritodrine were in the five percent range and that the incidence of respiratory distress was 11 percent. In contrast, babies born to women who received other forms of treatment for premature labor died at the rate of 13 percent and experienced respiratory distress at the rate of 20 percent.

Ritodrine works by relaxing the uterus and thereby prolonging pregnancy. □