Behavior

Infant brains reflect moms' depression

Preliminary evidence suggests that the distressed behavior of infants born to depressed mothers occurs in conjunction with electrical-activity changes in the emotion-regulating regions of the babies' brains.

"This may be the first study to show that maternal psychopathology affects brain activity that mediates infant behavior," says psychologist and research director Geraldine Dawson of the University of Washington in Seattle. She described the results last week at a seminar held at the National Institute of Mental Health in Bethesda, Md.

Dawson's group drew inspiration from psychologist Nathan A. Fox of the University of Maryland in College Park, who found that electrical activity across the surface of a healthy infant's left frontal lobe, as measured by electrodes on the scalp, increases during positive emotions, whereas electrical activity across the right frontal lobe increases during negative emotions (SN: 9/9/89, p.175). Other researchers detected amplified right-frontal activity among depressed college students, even when their moods temporarily lifted.

The Seattle investigators studied 34 infants between 11 and 17 months of age. All were born to low-income teenage mothers, most of whom were Caucasian. Self-reports indicated that half the mothers were clinically depressed during the week before the experiment, with symptoms that interfered greatly with daily functioning.

Dawson's team monitored electrical activity in the infants' brains during a series of laboratory experiences. Each baby first watched a video screen displaying cascading bubbles, providing investigators with a resting measure of brain electrical activity. Each mother then used a cardboard mask to play peek-a-boo with her infant. Next, a stranger entered the room, moved close to the baby while maintaining a neutral facial expression, and walked away. Finally, the mother briefly left the room and returned.

Infants of nondepressed mothers smiled and giggled during peek-a-boo, gazed steadily at their mothers, glanced intermittently and uncertainly at the stranger, and cried when their mothers left. Infants of depressed mothers rarely smiled at any time, usually looked away from both their mothers and the stranger, and showed little distress when mothers departed.

The reasons for the unusual responses of infants in the latter group remain unclear. Dawson suggests these babies may imitate their mothers' withdrawn demeanor or retreat from social interactions out of frustration and anger at dealing with a nonresponsive mother. Genetic transmission of depression may partially influence their behavior, she adds.

Whatever the case, electrical-activity changes in infants' brains corresponded with the onset of different behaviors and emotional displays during the experiment, Dawson says. Infants of nondepressed mothers displayed increased electrical activity in the left frontal lobe during pleasant peek-a-boo sessions, and an electrical surge in the right frontal lobe during the upsetting exit of their mothers. Among depressed mothers' infants, electrical activity in the right frontal lobe was greater at the start of the experiment and increased even more during peek-a-boo sessions, while left frontal activity peaked when the mothers left the room.

If a depressed mother begins to feel better and her interactions with her baby brighten, the infant's pattern of brain activity may change as well, Dawson speculates. She plans to test this prediction in an upcoming study.

Dawson also hopes to monitor the progress of six infants from her current study who displayed extremely high activation of the right frontal lobe at rest. Noting that five of these infants had depressed mothers, she asserts that this group may show a marked vulnerability to depression as they get older.

Biomedicine

Rick Weiss reports from New Orleans at the annual meeting of the American Society of Tropical Medicine and Hygiene

Worm R_x does double duty

Ivermectin, a drug widely distributed in Africa as a treatment for parasitic worms, takes an unexpected toll on disease-spreading mosquitoes, laboratory studies indicate. The tests suggest that many mosquitoes become infertile or die after ingesting blood from people who recently have taken the drug.

Ivermectin kills young parasitic worms in animals and people (SN: 10/6/90, p.215). A single annual dose keeps humans free of new worms for a year. In the new study, Robert B. Tesh and Hilda Guzman of the Yale University School of Medicine allowed three species of tropical mosquitoes to dine on vials of human blood containing ivermectin levels comparable to those in people who have taken the drug within the past several days. Many mosquitoes became paralyzed and then died; more than half the survivors were left infertile.

Colin D. Ginger, a parasitologist with the World Health Organization in Geneva, Switzerland, notes that most people who take ivermectin have insecticidal concentrations in their blood for only about a week each year. The Yale finding nonetheless represents "an important phenomenon," he says, because ivermectin's effects on mosquito ovaries hint that the drug specifically targets neurohormonal systems. Researchers still don't know how ivermectin works against worms. "If you could crack this [mechanism] in insects," Ginger says, "it would give us an idea of what to look for in worms." That could lead to even better anti-worm drugs, he says, including some that might linger longer in the blood at mosquito-killing levels.

Copepods make tire-heaps copacetic

Researchers express optimism about a new way of killing *Aedes albopictus,* the Asian mosquito that recently invaded the United States (see story, page 309). Gerald G. Marten of the New Orleans Mosquito Control Board reports that copepods — millimeter-long crustaceans that munch voraciously on mosquito larvae — work well as biological controls in the discarded tires where *Ae. albopictus* breeds.

Marten and his colleagues used a backpack sprayer to deposit 100 to 200 of the aquaculture-raised copepods into individual water-filled tires in used-tire dumps. Each tiny creature killed up to 100 mosquito larvae per day, eventually eliminating 99.9 percent of the pests, he says.

Marten has yet to test the system on a larger scale, but he expresses confidence that the method carries little risk of adverse environmental impact. "The [copepod] species we're using are already everywhere, in millions of puddles and ponds throughout North America," he says. "We're just trying to get them into a few places where they don't normally live."

Amoebic ambush artist: Salad days ahead?

Visvesvara

Tropical medicine specialists, with an eye for the unusual, continue to identify new or newly arrived disease-causing organisms in the United States. Among these is the "leptomixid" amoeba shown here, resembling a lettuce leaf in miniature. Since its 1986 discovery in the cyst-riddled brain of a dead baboon at the San Diego Zoo, the amoeba has caused 10 human encephalitis deaths in the United States, including two this year, says Govinda S. Visvesvara of the Centers for Disease Control in Atlanta. The organism, related to a harmless, soil-dwelling microbe, has never been detected outside its victims but may be ubiquitous in the environment, he adds.

Leptomixid-caused encephalitis appears untreatable, says Visvesvara, who suspects the amoeba has led to more deaths than the 16 now tabulated worldwide.