Behavior

Fail to snooze, immune cells lose

In the bleary-eyed land of the sleep-deprived, the body's immune defenses apparently take a nap. Even relatively modest sleep loss over one night markedly reduces the activity of an important type of infection-fighting immune cell, according to a new report. A good night's sleep restores these cells to their former vigor.

The health implications of such immune losses remain unknown. But the findings add to evidence that "sleep, like fever, may represent a basic host defense mechanism," contend Michael Irwin, a psychiatrist at the San Diego Veterans Affairs Medical Center, and his coworkers. For instance, research on mice and other nonhuman animals suggests that a brief period of sleep deprivation lowers resistance to influenza infection, while sustained sleep loss may bring on certain bacteria-caused illnesses.

Irwin's team studied 23 healthy men age 22 to 61 who spent 4 nights in a sleep laboratory. On the third night, volunteers were denied sleep between 3 a.m. and 7 a.m., losing nearly half their usual slumber time.

The activity of natural killer cells, a type of lymphocyte that helps to fight off viral infections, fell substantially in 18 of the men on the morning after sleep deprivation, the investigators report in the November/December PSYCHOSOMATIC MEDICINE. In fact, compared to the average activity level of these immune cells the day before, activity dropped 30 percent for the entire group after the shortened night's sleep. On the final morning of the study, after volunteers had returned to uninterrupted sleep, natural killer cells bounced back to their former vitality.

Early morning awakening and other sleep problems may contribute to the loss of immune function observed by other researchers (SN: 4/6/91, p.216) in depressed patients and in people who care for spouses with Alzheimer's disease, Irwin's group proposes.

Female war vets: Traumatic pains

A rare follow-up study of female Vietnam War veterans finds that current physical health complaints rise considerably in those who suffer from post-traumatic stress disorder (PTSD). Stress and trauma experienced by women in war zones may translate into poor health — or at least the perception of poor health — predominantly in those who develop PTSD, contend Jessica Wolfe, a psychologist at the Boston Veterans Affairs Medical Center, and her colleagues.

The researchers mailed a series of questionnaires to 109 female Vietnam veterans, including nurses and support personnel, who were not receiving treatment for PTSD at the Boston veterans facility.

Those describing the most exposure to Vietnam combat and casualties also reported the poorest general health and the greatest number of specific physical problems. But the strength of this link depended largely on the more frequent occurrence of PTSD in women who had confronted wartime traumas, Wolfe's group asserts.

Symptoms of PTSD include recurring memories or dreams of traumatic experiences, emotional numbing and detachment from others, and heightened physiological responses to novel or trauma-related cues. PTSD in male combat veterans and former prisoners of war can last for decades (SN: 2/2/91, p.68).

PTSD may boost reports of poor health for a number of reasons, according to the scientists. Depression and anxiety often arise in trauma reactions and may lead to physical complaints based on emotional distress. Heightened sensitivity to bodily changes, a typical feature of PTSD, may create a greater sense of urgency about medical symptoms. Moreover, physiological arousal and other PTSD symptoms may directly promote heart disease and gastrointestinal disorders.

Biomedicine

Nose-drop vaccine provides protection

Most vaccines rev up the antibodies that circulate in the blood. Only a few vaccines stimulate an immune response in the body's mucous membranes. Now, researchers report, they have developed a vaccine approach that does both.

Administered as drops in the nose, a vaccine made by the technique has immunized mice against *Borrelia burgdorferi,* the tick-borne bacterium that causes Lyme disease. The immunity lasted for up to a year, says Solomon Langermann of MedImmune, a biotech company in Gaithersburg, Md. Researchers have not yet tested this vaccine on humans.

Because *B. burgdorferi* does not enter mucosal tissue, the antibodies in the mice's blood protect them from the bacterium, Langermann and his colleagues report in the Dec. 8 NATURE. However, they note, the vaccine did increase the number of antibodies in the mucosae lining the animals' respiratory, gastrointestinal, urinary, and genital tracts.

Many bacteria and viruses, including those that cause pneumonia and sexually transmitted diseases, enter the body through mucous membranes. Vaccines that trigger antibodies present in mucosal secretions could presumably block these infections, Langermann contends.

He and his colleagues are developing a nose-drop vaccine against pneumonia and urinary infections and will investigate the possibility of making a similar vaccine against gastrointestinal infections, he says.

To produce the Lyme vaccine, the researchers genetically engineered a strain of Calmette-Guérin bacillus (BCG) to make a *B. burgdorferi* protein that stimulated production of antibodies against the bacterium.

Physicians outside the United States use BCG, a weakened form of a bacterium that infects cows, in the tuberculosis vaccine (SN: 6/18/94, p.393).

Other vaccines against human Lyme disease are available, but only for experimental purposes.

Lingering Lyme disease

The long-term effects of Lyme disease appear more common than previously thought, researchers report.

Studies of patients at neurology or Lyme disease clinics have shown that the illness can have long-lasting symptoms. But until now, researchers had not done a controlled study of the disease's long-term effects in the general population, asserts Nancy A. Shadick of Brigham and Women's Hospital in Boston and her colleagues.

The team compared the cognitive and physical well-being of 38 adults from Ipswich, Mass., who had developed Lyme disease in the past 1 to 11 years with 43 residents of the same town who had not suffered from the infection.

The Lyme group had a higher incidence of verbal memory impairment, fatigue, joint pain, and other musculoskeletal difficulties than the uninfected group, the researchers report in the Oct. 15 ANNALS OF INTERNAL MEDICINE. "The presence of arthralgias [joint pain] was by far the best predictor of previous Lyme disease," they assert.

Thirteen of the Lyme patients had long-term ills related to the infection. The longer someone had gone untreated after getting infected, the more apt he or she was to have persistent symptoms, the scientists report.

If not eradicated with drugs early on, *B. burgdorferi,* the bacterium that causes the illness, penetrates the body's central nervous system and joints, they note.

The Lyme group had all taken antibiotics for their disease, but not everyone had received what physicians now consider optimal treatment, Shadick and her colleagues say. For example, only 19 patients received antibiotics within a month of the onset of symptoms.