

The Psychobiology of Suicidal Behavior

Summarized by Thomas T. Thomas

Bruce Victor, MD, is the director of Clinical Psychology at California Pacific Medical Center, an expert consultant to the Medical Board of California, and a psychiatrist in private practice in San Francisco specializing in affective disorders. Dr. Victor spoke to members at the January 26 meeting about the psychobiology of suicidal behavior. Our program for the coming year will deal with suicide, which is a very real threat to victims of mental illness and a source of concern to their loved ones. Dr. Victor wrote the chapter on suicide for the upcoming American Psychiatric Association text on psychiatry.

He opened his presentation with a quick review of 2,000 years of models of psychological behavior. The ancient world, after Hippocrates, believed that affective disorders were caused by a chemical imbalance: in particular, the planet Saturn influenced the gall bladder to produce an excess of black bile. We get one of our words for depression from the Greek *melan*, meaning black, and *cholia*, meaning bile. This chemical view of psychiatry persisted until Freud, who theorized that symptoms were induced by interpsychic conflict, and that you could not treat symptoms until you resolved the conflict. In Freud's day such analysis took about six months; now it can go on for years.

As a result, the practice of psychiatry today does not deal well with fatal illnesses such as suicidal behavior. If other areas of medicine were to use this approach, Dr. Victor said, we'd all be in big trouble. Imagine a cardiologist examining a patient with chest pains and finding risk factors such as overweight, high blood pressure, high cholesterol levels, and smoking—then pulling his chin and saying, "Yes, under these circumstances, a heart attack is a wholly appropriate reaction."

Currently in the U.S., suicide accounts for 30,000 deaths a year. The statistics show that, while women make more suicide attempts, men actually kill themselves at a rate of three to one over women. Mood disorders affect fifty percent of completed suicides. Conversely, fifteen percent of patients with affective illness will eventually kill themselves. Those with a psychosis are more at risk than non-psychotics.

Dr. Victor quoted further statistics showing that suicide attempts are largely made by people under 35 in circumstances that offer a high chance of rescue. Completed suicides are mostly by people over 60—and that statistic tends to rise with age—in circumstances with a low probability of rescue.

The link between age and suicide is not hard to understand, he said, because in this country the elderly often live alone after the passing of a spouse, often live under reduced financial conditions, and are often faced with chronic, debilitating illness.

Dr. Victor then cited what he called his most depressing statistic: that between 1945 and 1985, with large advances in psychiatric theory during those

decades, the suicide rate in the general population has not changed much. It is still around 11 or 12 per 100,000 people. Moreover, a recent attempt to create a statistical model that would predict suicidal behavior, based on a study of 1,906 patients with high-risk affective illnesses, proved to have zero predictive value.

Now psychiatrists are beginning to move away from Freud and return to models of behavior based on chemical imbalance and neurophysiological dysfunction. The most interesting chemical to watch, Dr. Victor said, is serotonin—a brain chemical which regulates mood, impulse control, appetite and, apparently, self-destructive behavior. The evidence suggests that serotonin levels are low in people who attempt suicide.

Recent studies based on autopsy results have revealed:

- Decreased levels of serotonin and its byproducts in the brain stems (i.e., the more primitive brain sites) and cerebrospinal fluid of suicide victims.
- Decreased serotonin and byproducts in serious suicide attempters.
- Decreased serotonin receptors at *pre-synaptic* (i.e. before the synapse gulf) sites in the brains of victims.
- Increased receptors at *post-synaptic* sites in victims' brains. (This last finding shows the brain reaching harder for a chemical that's in limited supply.)

A separate Swedish study that was conducted to compare amounts of various brain chemicals in the cerebrospinal fluid of a large population coincidentally revealed that 20 percent of the people tested who showed decreased serotonin levels were dead by suicide within a year.

Dr. Victor then discussed Prozac, the presumed “happy capsule,” and the recent public controversy about its effectiveness. A broad attack on Prozac was launched based on six cases—out of 200 participants in a Harvard study—of paradoxical suicide after the antidepressant drug was administered. Dr. Victor analyzed those six cases and showed that other risk factors might have been at work, including complications from combined drug therapies, seasonal influences (most suicides take place in April and May), a troubling change in the patient's motor response called *akathisia*, and a sudden mood switch in patients with bipolar disorder.

Dr. Victor predicted that developments in neurochemical analysis will likely improve our treatment of suicidal behavior. He looked forward to the possibility of studying serotonin transmission in the brain by testing for certain byproducts in the cerebrospinal fluid or by analyzing serotonin receptors in blood platelets.

But on a psychiatric level, he said, assessing the risk of suicide still means evaluating all depressed patients, understanding that asking about suicide does not encourage it, approaching the subject gradually at first, and then being willing to probe a positive response by asking about the patient's specific suicidal thoughts or plans.

In conclusion, Dr. Victor said, we are leaving behind the stigma of depression. People generally understand now that depression is biological in origin, more common in women than in men, and responds to therapy. Depression is not a character weakness, a copout or inability to cope, or some kind of divine punishment. But of all the elements of depression, the one most directly correlated with suicide is a pervasive sense of hopelessness.