

Blood protein as hormone-cancer link

Estrogen hormones have long been associated with certain cancers, such as breast cancer and cancer of the lining of the uterus. It is known, for instance, that hormonal abnormalities from a variety of causes lead to an increase in the incidence of these cancers. Scientists, however, have been puzzled by their inability to detect increases in the amount of estrogen in women with these cancers. Pentii K. Siiteri of the University of California at San Francisco may have an answer to this riddle. During a recent interview he suggested that the availability of the hormone, not its total concentration, is the key factor. Some of the hormone, he explains, is bound to a blood protein and thus it is not free to act on such targets as breast and uterus tissue.

Siiteri has been measuring the binding of estradiol, the active form of estrogen, to a blood protein called sex hormone binding globulin. And he has found that the amount of binding protein in a woman's blood affects the amount of available estradiol. Thus, obese, postmenopausal women who have depressed levels of binding protein and normal levels of estradiol experience elevated levels of "effective" hormone. And because the binding pro-

tein is regulated by the thyroid gland, women suffering from hypothyroidism also may experience increased available estradiol. "Fluctuations in binding protein and in available estradiol may be the common denominator for endocrine abnormalities associated with breast cancer," Siiteri says.

Abnormal binding, as well as reduced amounts of binding protein, may influence the hormonal exposure of tissues. Siiteri and colleagues, for instance, have measured high levels of available estradiol in some breast cancer patients with normal binding protein levels. This decrease in binding could be due to an abnormality in the binding protein, but Siiteri suggests it is probably due to interference by other factors in the blood. Preliminary data indicate that the abnormality occurs in approximately one-third of breast cancer patients. "These patients are chronically stimulated by greater than normal amounts of available estrogen," Siiteri says.

A more extensive study of blood samples of 3,000 breast cancer patients and controls is underway. The investigators also plan to measure the binding protein and available estradiol levels in women who do not have breast cancer but who have a high incidence of breast cancer in their families. Siiteri suggests that a screening program may eventually result from such investigations. □

Shocking alternative to open heart surgery

A nonsurgical procedure that corrects atrial fibrillation (rapid, irregular contractions) with the use of an electric shock has been performed successfully by Melvin Scheinman, David Hess, Fred Moradi and Ruey Sung of the University of California at San Francisco. The technique was used on a 61-year-old man whose condition was not responding to anti-arrhythmic drugs (both conventional substances such as digitalis and experimental substances obtained from Europe) and whose use of steroids to treat rheumatoid arthritis made open heart surgery more than ordinarily risky. The researchers got permission from the Food and Drug Administration to use the electric shock technique, which Scheinman has performed in animal experiments for two years.

The preliminary part of the procedure—inserting a woven-Dacron catheter into a peripheral vein and running it up to the heart—had been used for years to record the electrical activity in the bundle of His (which, along with the A-V node, helps convey impulses from the atria to the ventricles). The twist in this case, however, was that the catheter was electrode-tipped and capable of delivering a large electrical defibrillating shock to the His bundle, destroying it and slowing the rate of ventricular contraction. A temporary pacemaker was inserted and replaced

with a permanent one a few days later.

Although the use of this technique was occasioned by a literally do or die situation and open heart surgery is usually performed when drug treatment is ineffective, the researchers are optimistic about its implications for the future. "The horizons that this may open are exciting to us and encouraging," says Hess. "There may be other types of arrhythmias that we may be able to treat." Scheinman is continuing his animal experiments with an eye toward such broader applications. □

Childhood vaccines

Two and a half years ago the Department of Health and Human Services launched a nationwide vaccination program in primary and secondary schools and in community health departments in an attempt to lower the incidence of rubella (German measles), measles and mumps among children. The Centers for Disease Control in Atlanta now reports that the incidence of all three diseases has declined dramatically, as have associated problems such as mental retardation, deafness, encephalitis and pneumonia. And CDC predicts that measles will probably be eliminated from the United States by the end of 1982. □

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