

MEDICINE

Use Clay in Arthritis Test

Bentonite is key element in new diagnostic test that may give doctors a quick method for spotting rheumatoid arthritis in time to begin treatment to prevent crippling.

➤ LAST SPRING the first large-scale reporting of a new diagnostic test for rheumatoid arthritis began filtering back to the researchers who developed it at the National Institute of Arthritis and Metabolic Diseases.

If the case reports from doctors throughout the nation prove as promising as preliminary laboratory results, physicians will have the simplest and quickest means now available to spot the disease in time to begin treatment that may prevent crippling.

The key to the new test is a clay known as bentonite and long in use for stopping water leaks in engineering works, clarifying wine and beer and as a binder in the making of charcoal briquettes for barbecue pits.

Up to now, doctors and laboratories have relied heavily on sheep cells for detecting rheumatoid arthritis. Sensitized red blood cells from a sheep are combined with antibodies from the blood of a rabbit. Serum from humans is then added to the sheep cell mixture. If an agglutination reaction or clumping results, doctors can be 90% certain that the patient has rheumatoid arthritis. Sheep cell agglutination, however, is time-consuming, expensive, and requires extensive laboratory facilities.

Other diagnostic tests for the disease have utilized various bacteria, red blood cells from man and other animals and even latex.

But none have shown the promise of bentonite and its use in the Bentonite Flocculation Test (BFT), as the new procedure is called.

The discovery that bentonite is a useful diagnostic tool for medicine, was originally made by researchers at another laboratory at the National Institutes of Health, where it was used for another disease, trichinosis. But research is not confined to a particular laboratory nor to a particular disease. It was only a matter of time before a second group of researchers concerned with arthritis worked out a new procedure for its use in spotting the nation's worst crippler.

The procedure employs as its key element bentonite, a kind of colloidal clay. This is mixed with normal human gamma globulin. A drop of blood serum from the person being tested is added to a drop of bentonite-gamma globulin mixture on a slide.

Basically, the BFT works on the same diagnostic principles that other rheumatoid arthritis tests do. Serum of patients with active, peripheral rheumatoid arthritis contains a "rheumatoid factor" which has the capacity to agglutinate sensitized particles.

If the test is positive, the clay particles will clump, or flocculate, within a few minutes and the clumping is detectable under a microscope.

In studies to determine its effectiveness,

the new test was given to 25 patients suffering from typical rheumatoid arthritis. The patients ranged in age from 18 to 69 years. In 20 of the patients (80%), the tests were positive. Another 163 patients suffering from other types of rheumatic disease and other disorders were used as controls. In this second group, only three (1.8%) showed a positive reaction.

The preliminary results indicate that the BFT can detect eight out of 10 cases of rheumatoid arthritis accurately and yields false positives in less than two out of 100 cases.

Perhaps of greater importance, however, is the fact that the test is so rapid and simple that it can be performed in a clinical laboratory or doctor's office in 20 minutes. It has the added practical advantage, its developers point out, of requiring only readily available materials and equipment.

The procedure has been sent to doctors throughout the country to be put to a large-scale test. If it proves effective, it will not only mean earlier detection of the disease, but in turn may throw more light on the nature of the disease itself.

It is hardly imaginable that a doctor can keep a sheep in his office, but with the plumber's clay it is now possible for him and his assistants to perform 100 tests a day and tell a patient whether or not he has signs of rheumatoid arthritis before he leaves the office.

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TECHNOLOGY

AEC Reports Progress

➤ NUCLEAR REACTORS for use in aircraft are being tested in at least seven projects revealed in the 25th semi-annual report of the Atomic Energy Commission presented to Congress.

For manned vehicles a direct cycle system is under test at Arco, Idaho, while Pratt and Whitney in Connecticut are testing a system in which compressed air picks up heat from liquid-metal coolant from the reactor.

Protection of crew by shielding has been tested in 47 flights carrying a one-megawatt reactor in a conventionally-propelled airplane.

Reactors for both rocket and ramjet types of unmanned missiles are being developed. Two reactors for auxiliary power to be used in space flight are being designed. No timetable for results has been announced.

Before the end of 1960, five atomic power plants generating a total of 557,000 kilo-

MEDICINE

Chemicals Can Prevent Spread of Cancer Cells

➤ A CHEMICAL approach to the successful arrest of cancer cells that spill over or slough off tumors and lead to recurring malignancies has been reported.

Surgical removal of tumors leaves the patient susceptible to further malignant growths due to cells that spread through the body by way of the circulatory and lymphatic systems, remaining cells around the wound and/or cells deposited on the body from surgeon's gloves. Results of a study to curb the spread of such cells were reported by Dr. Warren H. Cole of the College of Medicine at the University of Illinois.

Patients with lung, breast, stomach, colon or rectal tumors are administered one or several of 15 types of drugs, including nitrogen mustard. They receive injections of the drugs through the veins. In addition, the wound area is thoroughly washed with the drug in the hopes that all cells loosened by the operation procedure will be reached, Dr. Cole reported.

More than 45% of those cancer patients with moderately favorable cases will experience some type of growth recurrence, Dr. Cole pointed out. Stemming this regrowth and spread is the problem facing scientists.

Dr. Cole emphasized that while the drugs now available are not killing the free-floating cancer cells in every case, as soon as more effective chemicals can be developed, more of these patients will receive this type of chemical treatment.

It has been estimated that from 10% to 30% of these patients have floating cancer cells in their blood stream alone.

Dr. Steven G. Economou, Rudolph Mrazek, Harry Southwick, Gerald O. McDonald and Danely Slaughter assisted Dr. Cole.

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watts of electricity (1,801,000 heat kilowatts) will go into operation in the United States, the report shows. Two more totaling 85,500 electrical kilowatts (290,500 heat KW) will come on line in 1961, while 1962 will see four more with a capacity of 138,950 electrical kw (483,000 heat KW) start working.

Nuclear powered U.S. Navy ships now total 36, operating, launched, under construction or authorized. Of these, there are five submarines operating, three more launched, 15 under construction and 10 authorized.

Three surface vessels, one an aircraft carrier, are under construction.

The U.S. research on the taming of the H-bomb fusion reaction to produce peaceful power is reviewed, but no progress is reported beyond that made known to the Geneva conference last August.

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