

## A NEW AND SIMPLE TEST FOR DIFFERENTIATION OF SOME SERIOUS DISEASES

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While working on the serological diagnosis of tuberculosis over the last 20 years I developed a very simple test that can show in one minute whether a person has any of the serious infectious and suppurative diseases including tuberculosis, cancer, leukemia and lymphoma or not. This test basically consists of placing a drop of blood obtained from the fingertip on a slide, adding a drop of each of two different solutions into it and observing whether a small red presipitations occur in the mixture or not.

During the last two months this test has been applied to a sample of 268 persons including healthy ones as well as patients with various diseases. The methodology and the results obtained are given below:

### I. Methodology

#### A. Solutions

1. 0,75% Eosine solution (Solution A). This solution was obtained by dissolving Eosine in distilled water.

2. Glycine - Saline Buffer Solution (pH 8,2), obtained by dissolving 7,5 gr glycine in 975 cc distilled water. To this 2,5 cc 1 N. NaOH was added. The mixture was increased to 1.000 cc by adding distilled water and furthermore 8,5 gr NaCl was added.

3. 1 %  $\text{CaCl}_2$  solution, obtained by dissolving 1 gr granuler pure  $\text{CaCl}_2$  in 100 cc distilled water.

4. Three parts of Glycine - Saline Buffer Solution was mixed with one part of 1 %  $\text{CaCl}_2$  solution. Sodium Azide of 1/20 concentration in distilled water was added to this mixture until the mixture reached a sodium Azide concentration of 1/2.000. The resulting mixture was used in the test and it will be called Solution B.

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### B. Application

A full drop of blood obtained from the fingertip was placed on a slide. A drop of Solution A was added and mixed with the tip of the lanset and the mixture was spread over the slide. Next, a drop of Solution B was added, mixed and spread similarly. The slide was rolled back and forth a couple of times. When many red granulations appeared in the mixture within two minutes the test was considered as positive. A positive test result indicated the presence of one of the pathological situations mentioned above. Although the granulations could be observed by the naked eye, they were more easily seen with a magnifying glass. The magnitude and volume of granulations varied from case to case. In some cases granulations took longer to occur and they could be seen with difficulty by the naked eye. In other cases, granulations occurred immediately and were seen clearly and definitely.

### II. Findings

Results of test applied during the last two months to 60 healthy persons and 208 patients with various diseases are presented below:

#### A. Tuberculosis :

In most of the cases either treatment had not yet begun or the subjects were into a maximum of two months of treatment. Such cases were chosen because a previous study indicated that treatment reduces and eventually eliminates the positivity of the test. Detailed studies on the interaction between the length of treatment and the test results have been postponed.

Case	number	Positive	Negative	Remarks
Pulm. Tbc.	73	72	1	
Sequela lesions	6		6	No activity criteria. Fibro-calcerous sequelas in the lungs.
Tuberculous lymphadenitis	1	1		
Pulm. Tbc.	4		4	The test was positive a month ago. With treatment a significant decrease was observed in the lesions.
Pulm. Tbc.	4		4	Under treatment fore more than two months.
Tuberculous pleurisy	5	5		
Tuberculous pleurisy	1		1	Under antituberculous treatment + corticotherapy for a month.
Pleural sequela	1		1	15 months ago antituberculous treatment.
Tuberculous Empyem	1	1		

In all those cases who had either just arrived at the hospital and had therefore not yet been subjected to any treatment or who had a few days of treatment the positivity of the test was very clear and granulations occurred in less than half a minute. In those cases who were under treatment positivity decreased as the length and efficiency of treatment increased. In these cases granulations occurred late and were observed with great difficulty by the naked eye. Similarly, if cortison were added to antituberculous therapy this decrease in positivity was more pronounced.

**B. Leprosy**

The test was applied to 17 patients in Elaziğ Lepra Hospital. All subjects had received treatment for many years and were still being treated.

	Case number	Positive	Negative	Remarks
Lepromatous leprosy	15	8	7	
Tuberculoid leprosy	2		2	
Cured patients	10		10	Subjects no longer on medication and currently employed by the hospital.

**C. Cancer**

28 cases with cancer were given the test. In 26 of these, plus a patient with gastric cancer, and 4 patients with malign mesotheliomas the positivity of the test was most striking. The test showed negative result in only one patient who had received intensive therapy. It is well known that no method currently exists to ascertain changes in the composition of blood in patients suffering from cancer which is the most important health problem on the world. In patients no subjected to radiotherapy or chemotherapy, granulations have occurred sooner and they have been more obvious than granulations in tuberculosis cases.

	Case number	Positive	Negative	Remarks
Lung cancer	26	26		Radiotherapy + Chimiotherapy + Corticotherapy
Lung cancer	1		1	
Gastric cancer	1	1		
Galign Mesothelioma	4	4		

#### D. Various Diseases

The test was positive in 5 out of 7 lymphoma cases and positive in 4 out of 6 leukemia cases. As the number of cases few and as we intend to study these diseases in greater detail in the future, the few cases observed have not been classified by types.

The test gave negative results in 28 cases involving retarded growth, peptic ulcer, chronic bronchitis, emphysema, viral lung infections and congestive heart failure. No positivity was found in this limited sample of these diseases.

Furthermore the test was positive in 2 cases of brucellosis, one case of suppurative lung hydatidosis, 2 cases of pneumonic infiltration, one of the 3 bronchiectasia which was suppurative. Finally, the test was positive in only one of 4 bronchial asthma and negative in the remaining 3.

#### E. Healthy Persons

This sample of 60 consisted of doctors, nurses, and other employees of sanatorium and clinics of Chest Diseases. Naturally all of these people must have been repeatedly exposed to tubercle bacilli and their tuberculin reactions must have been positive.

	Case number	Positive	Negative	Remarks
Healthy persons	58		58	
Healthy persons	2	2		These were included in the sample because they were employed and they did have any obvious disease. One was a woman 6 months pregnant, and the other subject had purulent sinusitis.

### III. Discussion

When the results are considered as a whole it can be seen that the test is positive in almost all of untreated cases of tuberculosis and cancer, in more than half of the cases of leukemia and lymphoma, in nearly half of the cases of leprosy, and in infectious and suppurative diseases. An important aspect of the test is that it is negative in almost all of healthy persons.

The explanation of the biochemical attributes of the test will be naturally very beneficial. During this study the following have been established :

The test conducted with blood serum of the positive case produces negative result. Whereas test conducted with the plasma of the positive case produces positive result. Therefore, it is possible to conclude that a substance in the plasma, probably fibrinogen, is responsible for the results. But the positivity of the test is not proportional to the percentage of fibrinogen in the blood. Although in healthy persons and in cases with negative test results, the level of fibrinogen is lower than in others, in two persons with identical levels of fibrinogen the test may be positive in one and negative in the other. Furthermore the test may be weakly positive at the level of 600 % fibrinogen but strongly positive at the level of 500 %. However, no positivity at 200 % mg and no negativity above 500 % mg has been found. These findings suggest that some other agent is also at work in addition to fibrinogen.

Another point is that heparin does not eliminate the positivity of the test. Test applied to blood drawn into a tube containing heparin maintains its positivity.

At low temperatures, such as 10°C, the test is either negative or reaction is delayed. Best reaction is obtained at room temperature. Near 37°C either no granulations occur or very weak reaction is obtained.

The positivity of the test has no relation to the rate of blood sedimentation. Naturally in serious diseases rate of sedimentation will usually increase. But negative results at 100 mm/hour and positive results at 10 mm/hour are not rare.

#### **IV. Conclusions**

1. Being simple, practical and easy to apply, this test can be used by doctors as well as other health personnel and even school teachers everywhere, particularly in rural areas.

2. Since the test can identify a pathological condition in a single minute with the help of a single drop of blood obtained from the fingertip, it can be used for screening of tuberculosis, tumors and some serious diseases, all over the world. Thus it is a new tool in promoting public health.

3. In tuberculosis cases, the effectiveness of the treatment can be evaluated with the help of this test, in addition to other criteria. Reduction in or complete disappearance of previous granulations indicate the effectiveness of the treatment.

4. Whether this test is directly or indirectly related to the level of fibrinogen in the blood, this particular application has been instrumental in taking the fibrinogen out of the laboratory and assigning it a great and practical importance in the relationships between the medical profession and public at large.