Plasminogen Levels in Schizophrenia

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Serum plasminogen levels were measured in 50 normal subjects and 82 schizophrenic patients. The levels of plasminogen were significantly elevated \((p < 0.001)\) in the group of schizophrenic patients.

The possibility exists that patterns of changes in the concentrations of known blood proteins might occur in populations of schizophrenic patients. Quantitative delineation of such patterns would be of potential diagnostic value and might provide insight into biochemical processes occurring in this disease. We have demonstrated increases in haptoglobin (1) and fibrinogen (2) concentrations, as well as total serum proteins and protein-bound carbohydrates (1). The findings on elevated fibrinogen levels have been followed with a study of plasminogen, a component of the fibrinolytic system, with the results described here.

Materials and Methods

The blood samples from the schizophrenic patients were those described previously (2). The 50 control samples were taken between 1 and 3 P.M. each day over a 3-day period. Other controls have been followed over 2 years. Plasminogen was measured by a modification of the caseinolytic method of Norman (3) as described elsewhere (4).

Results

In order to obviate any possible circadian effects on plasminogen concentration, the control samples and the samples from the schizophrenic patients were taken at the same time of day (between 1 P.M. and 3 P.M.). The results obtained for the control group are tabulated as a frequency distribution in Fig. 1. The mean was 0.150 absorbance units and the standard deviation 0.026. The group included one exce-
tionally low value which falls within the range of the familial deficiency described by Jacobsen (5).

The plasminogen values found in the serum samples from 82 schizophrenic patients are plotted in Fig. 2. The mean was 0.170 absorbance units and the standard deviation was 0.017. This population also included one very low value. It is apparent from a comparison of the distributions that the levels of plasminogen in the schizophrenic population were shifted toward higher amounts of activity. Thus, 55% of the values from schizophrenic patients were above 0.170 units, whereas only 16% of the values from the normal population were above this level. The difference between the means of the two groups was statistically significant with $t = 4.8$ and $p < 0.001$.

**Discussion**

The currently available data on abnormal plasminogen concentration are primarily in the direction of a decrease in levels (5, 6), with the only reported increase being a modest 15% during pregnancy (7). One report (5) states that the level of plasminogen is not affected by stress, anxiety, meals, or age. Thus, there is no body of knowledge permitting further interpretation of the present results. If these findings can be verified in other schizophrenic populations, it would appear worthwhile to explore mechanisms and, in particular, to relate these data to the
previously described increases of fibrinogen and haptoglobin. These data strongly emphasize the need for knowledge of the conditions affecting the concentrations of these blood proteins and the mechanism of induction of such changes such as by estrogen treatment (8). Such knowledge would enhance the diagnostic potential of these measurements for clinical medicine, as well as providing information of basic importance on the response of the human organism to disease.

References


Erratum


Under Reagents, p. 157: To “3. Alcoholic potassium hydroxide . . . 95% alcohol.” should be added “For working solution, dilute 10 ml. of this stock solution to 50 ml. with 95% alcohol on day of use.”

Under Reagents, p. 157: Reagent 6 should read “Sodium arsenite, 0.5 M.”

Under Methods, p. 158, the sentence starting on line 9 should read “After exactly 10 min. the oxidation was stopped by the addition of 0.1 ml. sodium arsenite.”