Hyperfibrinogenemia in Schizophrenia

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The mean plasma fibrinogen concentrations in one group each of newly admitted and institutionalized male schizophrenic patients were found to be significantly increased ($p < 0.001$) above normal. The results could not be attributed to occult medical disease.

Two assays developed in studies aimed at detection and measurement of blood factors specific for schizophrenia have employed plasma and plasma fractions (1, 2). It has been reported that use of serum obscures the differences between normal individuals and patients in one of these assays (3). Since one source of difference between plasma and serum is the conversion of fibrinogen to fibrin, and since fibrinogen data are not available for patients with psychosis, it appeared worthwhile to determine fibrinogen concentration in schizophrenic patients. We had previously observed significantly elevated levels in a group of newly admitted patients with a diagnosis of schizophrenia (4).

Methods

Fibrinogen was quantitated by Jacobson's method (5) on blood samples drawn with ethylenediaminetetraacetic acid (EDTA) as anticoagulant. All of the specimens from the 80 institutionalized patients were drawn on the same day in November between 1 and 3 p.m. These patients, all males, had been hospitalized 1–25 years. They were ambulatory and considered by the staff physicians to be in good physical health. They ranged in age from 27 to 61 years with a mean age of 45 years.
Results

The fibrinogen values found for these patients form a symmetrical normal curve of distribution (Fig. 1). The mean value of 431 mg./100 ml. plasma is significantly elevated ($p < 0.001$) above the normal mean of 295 mg./100 ml. as shown in Table 1. Indeed, all but two of the

![Fig. 1. Frequency distribution of fibrinogen concentration in plasmas of 80 institutionalized male schizophrenic patients.](image)

Table 1. Plasma Fibrinogen Concentration of Newly Admitted and Institutionalized Schizophrenic Patients

<table>
<thead>
<tr>
<th>Subjects</th>
<th>No.</th>
<th>Mean (mg./100 ml.)</th>
<th>Standard deviation (mg./100 ml.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>20</td>
<td>295</td>
<td>60</td>
</tr>
<tr>
<td>Schizophrenic (newly admitted)</td>
<td>13</td>
<td>383*</td>
<td>45</td>
</tr>
<tr>
<td>Schizophrenic (institutionalized)</td>
<td>80</td>
<td>431*</td>
<td>75</td>
</tr>
</tbody>
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*A statistically significant increase ($p < 0.001$) above the normal mean concentration.

values for the patients were above the mean for normal individuals. If 400 mg./100 ml. is taken as the upper normal limit, then 63% of the patients had higher fibrinogen values.

A partial assessment of the role of institutional confinement and treatment on these results was provided by assay prior to treatment (4) of 13 patients newly admitted to a psychiatric ward. A diagnosis of schizophrenia was established in all of these patients. Again, the mean fibrinogen concentration of 383 mg./100 ml. plasma was significantly elevated ($p < 0.001$) above the normal mean.

The possibility was also considered that the observed elevation of fibrinogen concentration was a consequence of undetected organic disease involving tissue destruction, which is known to result in increased fibrinogen concentration (6). However, the results of other assays
sensitive to such processes (7)—including C-reactive protein, ceruloplasmin, and erythrocyte sedimentation rate—were within the normal range (4) as has been previously observed (8). Thus, a more specific mechanism would appear to be responsible for the elevation of fibrinogen concentration in these psychiatric patients. The relationship of this fibrinogen elevation to the elevation in haptoglobin which we have reported (4) remains to be determined.

Discussion

A comparison of these data and of factors influencing fibrinogen concentration with similar information for the plasma factor which affects cellular oxidation in chicken erythrocytes shows a number of parallels. Both fibrinogen concentration and the plasma factor are increased in 60% of patients, and both are affected by pregnancy, estrogen treatment, and stress. Despite these parallels, it appears unlikely, on the basis of purification studies (9), that they are identical. However, fibrinogen may be responsive to the same inducing mechanisms and might provide a means of gaining additional insight into these mechanisms. The potential clinical effects of a chronically elevated fibrinogen concentration also deserve consideration, although little information is available on this subject (6, 10, 11).

References