

## Family Studies of MZ Twins Discordant for Schizophrenia: Neurological Findings

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Over the past six years the Section on Twin and Sibling Studies, NIMH, has conducted intensive studies of 16 families with MZ twins discordant for schizophrenia. In addition, 3 families in which both twins were schizophrenic and 4 with no known psychiatric illness have been similarly investigated.

Each family is admitted to the Clinical Center, NIH, for two weeks of multidisciplinary investigation. In the hope of shedding light on the question of neurologic findings in schizophrenic patients and their role in this disorder, detailed neurological examinations are performed on the twins by two neurologists. Patients with gross neurologic disturbance are screened out by our selection criteria. The examiners are therefore explicitly seeking minor deviations in neurologic status, rather than patterns of symptoms and signs leading to a specific neurologic diagnosis. Given this context, the neurologists recorded substantial numbers of signs. Yet, in none of the twins was there sufficient evidence to warrant a neurologic diagnosis.

The pairs of neurologic reports were subjected to a variety of procedures, in an attempt to quantify the results. For example, 11 of the first 13 index schizophrenic twins, as compared with 1 of 13 cotwin controls, were rated as having "probable" or "definite" neurologic abnormality, based upon the senior author's analysis of the number and type of signs recorded and the degree of agreement between the examiners. Significant group differences on number of signs reported were found between schizophrenics and nonschizophrenics, schizophrenic indexes and their cotwin controls, and schizophrenics and normals. In contrast, there were no significant group differences in the number of signs found between the nonschizophrenic cotwin controls and the normal twins.

Although the examining neurologists were given no history as to the psychiatric status of the twins, they soon identified the schizophrenic member of the pair, when there was one. In view of this, and because the data analyses listed above were conducted by the senior author, who also knew the psychiatric status of the twins, a blind (as to psychiatric status) analysis was undertaken. This procedure should eliminate to a large extent any bias in the judgement which might be due to "pa-

tienthood". For this procedure, each neurologic examination protocol was edited to eliminate clues to patienthood. They were assigned a code number and sent to a neurologist who had never seen the twins.

The results of this analysis, a comparison with the "nonblind" analysis of the same examinations, as well as some of the problems in interpreting our findings because of differences in level of anxiety, experience with ECT, drugs, hospitals, etc., between the schizophrenic and nonschizophrenic twins will be discussed in a later paper.

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