The Course of Neuropsychological Performance and Functional Capacity in Older Patients with Schizophrenia: Influences of Previous History of Long-Term Institutional Stay

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Background: Chronically institutionalized patients with schizophrenia have been reported to manifest cognitive and functional decline. Previous studies were limited by the fact that current environment could not be separated from lifetime illness course. The present study examined older outpatients who varied in their lifetime history of long-term psychiatric inpatient stay.

Methods: Community-dwelling patients with schizophrenia ($n = 111$) and healthy comparison subjects ($n = 76$) were followed up to 45 months and examined two or more times with a neuropsychological battery and performance-based measures of everyday living skills (University of California San Diego Performance-Based Skills Assessment Battery [UPSA]) and social competence. A mixed-effects model repeated-measures method was used to examine changes.

Results: There was a significant effect of institutional stay on the course of the UPSA. When the schizophrenia patients who completed all three assessments were divided on the basis of length of institutional stay and compared with healthy comparison subjects, patients with longer stays worsened on the UPSA and social competence, while patients with shorter stays improved. For neuropsychological performance, both patient samples worsened slightly, while the healthy comparison group manifested a practice effect. Reliable change index analyses showed that worsening on the UPSA for longer stay patients was definitely nonrandom.

Conclusions: Lifetime history of institutional stay was associated with worsening on measures of social and everyday living skills. Neuropsychological performance in schizophrenia did not evidence the practice effect seen in the healthy comparison sample. These data suggest that schizophrenia patients with a history of long institutional stay may worsen even if they are no longer institutionalized.

Key Words: Aging, cognition, disability, schizophrenia

Cognitive functioning in schizophrenia appears to be stable over the life span. When adjusting for normative changes with aging and for demographic factors, little change is seen over time across different follow-up periods in patients of different ages (1). Further, people with schizophrenia show generally similar improvements in performance (i.e., practice effects) with retesting as healthy individuals (2). There have been some suggestions that there are greater aging-related differences on more demanding cognitive neuroscience tests (3,4), but even these differences are minimal compared with the cognitive declines noted in neurodegenerative conditions.

An apparent exception to these findings is older individuals with a history of a chronic course of illness and lengthy institutional stay. Changes in cognitive performance have been detected in this population with follow-up intervals as abbreviated as 18 months (5). Findings of greater cognitive impairment in such populations has been found at different research sites (6,7), arguing against the interpretation that there is something unique about one patient sample. Among these institutionalized samples, poorer baseline performance, lower educational attainment, and older age are correlates of risk for cognitive and functional decline (5,8), as are more severe symptoms of psychosis (9).

Of course, it is not possible to determine in institutionalized samples whether characteristics of the environment or the patients that lead to institutionalization are determinants of decline. Only a longitudinal comparison of trajectories of currently ambulatory people with schizophrenia who vary in their history of institutionalization can address the question of environmental influence or patient individual differences. This article presents the results of such a study.

During the 1990s and early 2000s in the metropolitan New York area, several large state psychiatric facilities were consolidated and many of the patients residing there discharged to community residences or nursing facilities. Concurrently, the New York regional Veterans Integrated Service Network initiated an effort to reduce the size of its extensive inpatient facilities. We reported on this process, showing that only current aggression and length of previous institutional stay were predictors of the likelihood of discharge during this downsizing process (10). Many patients were sent to the community and received clinical care at the same facilities where patients with no history of institutional stay were treated.

In the current study, a sample of older (age >50) community-dwelling people with schizophrenia were identified and assessed with neuropsychological (NP) tests and performance-based measures of everyday living skills and social competence (referred to as functional capacity). These patients had a wide-ranging history of previous institutional stay, from 1 to 360 months, and all were seen for their baseline assessment more than 5 years

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after the longest stay. A sample of healthy individuals with no lifetime history of major mental illness was also examined with the NP and functional capacity assessment. These healthy individuals were selected for a lifetime history of moderate educational and occupational attainment. Reassessments were performed at 18-month intervals.

Thus, this study minimized many of the confounds of previous studies, by including older aged noninstitutionalized samples, avoiding the environmental effects of institutional care, and assessing course in comparison with healthy, generally demographically similar individuals. This design allowed us to use longitudinal statistical techniques, while considering both diagnosis and demographic factors as predictors. Our basic hypotheses were that people with schizophrenia and a history of long institutional stays would be at higher risk for cognitive and functional decline and that the variables that previously predicted risk for decline in samples of institutionalized patients, including older age (11) and lower educational attainment, would add to the prediction of cognitive and functional decline.

Methods and Materials

Participants

Older community-dwelling outpatients who met DSM-IV criteria for schizophrenia or schizoaffective disorder were enrolled in this longitudinal study investigating the course of cognitive and functional status. Exclusion criteria consisted of a primary DSM-IV Axis I diagnosis other than schizophrenia or schizoaffective disorder, a lifetime history of substance dependence or current substance abuse disorders, Mini-Mental State Examination (12) score below 18, Wide Range Achievement Test 3rd edition (13) reading grade-equivalent of grade 6 or less, or any medical illnesses that might interfere with performance on tests of cognitive functioning. The Comprehensive Assessment of Symptoms and History (14) was completed by trained research assistants and diagnosis was confirmed by a senior clinician. Subjects were also required to demonstrate evidence of not having fully recovered at the time of recruitment, as evidenced by meeting at least one of three criteria: 1) an inpatient admission for psychosis in the past 2 years; 2) an emergency room visit for psychosis in the past 2 years; or 3) a score on the Positive and Negative Syndrome Scale (15) positive symptoms items regarding delusions, hallucinations, or conceptual disorganization of 4 (moderate) or more at the time of their baseline assessment.

In the patient group, all subjects were receiving treatment with second-generation antipsychotic medications at each assessment. After the testing procedures were fully explained, all subjects signed a written informed consent form approved by the institutional review board at each research site, where ethical committee approvals were obtained.

Healthy comparison subjects were recruited at a "naturally occurring retirement community" in Manhattan. All residents had to be eligible to reside in public housing, which created a population of individuals who were not extraordinarily high functioning over their life span. All healthy comparison subjects were screened with the Comprehensive Assessment of Symptoms and History as well and were excluded from participation if they met current or lifetime criteria for major depression or any psychotic condition and met the screening criteria applied to the schizophrenia sample. Healthy control subjects also signed written informed consent approved by the local institutional review board.

Measures

All subjects completed the test battery in a fixed order, with functional skills assessment, a cognitive test battery, and a symptom interview. All interviewers received extensive training in performing all assessments and every 3 months their performance was evaluated through re-rating of training tapes, dual ratings of the functional status measures with a senior staff, and quality assurance assessments of all testing.

Performance-Based Measures of Functional Capacity. The University of California San Diego Performance-Based Skills Assessment Battery (UPSA) (16) was designed to directly evaluate the ability to perform everyday tasks that are considered necessary for independent functioning in the community. In this study, four derived domains of the UPSA were used: comprehension/planning (e.g., organizing outings to the beach or the zoo), finance (e.g., counting change and paying bills), transportation (e.g., using public transportation), and communication (e.g., using the telephone, rescheduling medication appointments). We excluded the household chores subtest because the analogue kitchen required was not portable enough to be used at field sites. We then restandardized the scores to a 100-point scale, like the original five-subtest UPSA, thus allowing comparisons to previous results. This modified version was used in our previous reports with the UPSA (17,18).

The Social Skills Performance Assessment (SSPA) (19) is a social role-play task in which the subject initiates and maintains a conversation in two 3-minute role-play tasks: greeting a new neighbor and calling a landlord to request a repair for a leak that has gone unfixed. These sessions were audiotaped and scored by a trained rater who was unaware of diagnosis (patient or healthy comparison [HC]) and all other data from the study. These raters were trained to the gold standard ratings of the instrument developers, with an intraclass correlation coefficient of .86 and high interrater reliability was maintained at 3 months (intraclass correlation coefficient = .87). The mean of the ratings across the two subtests was the dependent variable.

Cognitive Assessment. Neuropsychological tests were selected to represent diverse cognitive domains that were previously shown to be the most consistently correlated with functional skills (20,21). These tests included the Wisconsin Card Sorting test (22); Trail Making Test Parts A and B (23); learning trials 1 through 5, long delay recall, and recognition from the Rey Auditory Learning Test (24); FAS verbal fluency (24); animal naming (24); and the digit span, letter-number-sequencing, and digit symbol coding subtests of the Wechsler Adult Intelligence Scale 3rd edition (25).

All raw scores on the NP tests were converted to age-, education-, and gender-corrected standardized (*Z*) scores from published norms. These normative corrections were also applied to the performance of the HC sample as well, because this was a sample whose performance was expected to be slightly below the population average.

Procedures

Assessment and Follow-Up. Follow-up assessments were scheduled at 18-month intervals after initial entry into the study. Patients and healthy comparison subjects were examined with the same assessments in the same sequence at each subsequent follow-up visit (with the exception of the Mini-Mental State Examination and Wide Range Achievement Test 3rd edition reading recognition, which were only administered at baseline for screening purposes). Alternate test forms were not available