

# A Bio-Psycho-Social Approach to Overcoming Delusional Symptoms: From Insight, Brain Structure, and Social Functioning in Patients with Schizophrenia to Delusional Interpretation in Healthy Subjects

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Delusion is a symptom of having beliefs and ideas that differ from reality. Delusions can interfere with interpersonal relationships and have a negative impact on a wide range of social activities. This study examines "overcoming delusional symptoms" from biological, psychological, and social perspectives. The main subjects in the study were patients with schizophrenia.

Schizophrenia is a psychiatric disorder that presents with positive symptoms, negative symptoms, and cognitive dysfunction. One of the symptoms of schizophrenia is a lack of insight. Since lack of insight decreases adherence to treatment and medication, leading to treatment discontinuation. Study 1 first examined the relationship between insight, medication adherence, and psychiatric symptoms. We analyzed 299 patients' data, and the results showed that better insight was associated with better medication adherence, and among the sub-dimensions of insight, being aware of the need for treatment and medication was associated with medication adherence. Among the other sub-dimensions of insight, the more correctly a person recognizes that the illness caused their psychotic experiences, the less severe the psychiatric symptoms. These results suggest the importance of improving insight in treatment.

It is also known that insight changes over time. On the other hand, there have been few longitudinal studies of insight. In Study 2, 163 patients with schizophrenia were evaluated longitudinally at two-time points and classified into three groups based on the characteristics of changes in insight. In addition, since most of the previous studies on insight and intelligence have used simple tests and failed to examine the relationship between various aspects of intelligence and insight, all WAIS-III tests were administered in this study. The sub-indices of intelligence were evaluated and analyzed. The results showed that patients with persistently poor insight at both time points had a lower cognitive function, especially verbal comprehension, than patients whose insight changed between the two-time points or patients with persistently high insight. We found the group with persistently poor insight had more severe symptoms than the other two groups, especially positive symptoms.

An inevitable part of any discussion of schizophrenia is its biological pathogenesis. Patients with schizophrenia are known to have distinctive brain structures, and the globus pallidus has long been the focus of attention. The globus pallidus is a part of the basal ganglia that sends signals to other parts of the basal ganglia, such as the thalamus and striatum, and as a loop, plays a regulatory role in the excitation and inhibition of motor learning, executive function, and behavior, and emotion. It is known that the volume of the left and right globus pallidus is larger in patients with schizophrenia than in healthy controls, especially left-lateralized. However, the relationship between

the globus pallidus, a characteristic of the brain, and psychiatric symptoms, the main symptom of schizophrenia, has not yet been agreed upon. In Study 3, we used MRI images of 276 patients with schizophrenia to examine the relationship between the volume of the globus pallidus and the severity of symptoms. The results revealed that the larger the right globus pallidus volume, the more severe the positive symptoms. This result was maintained in an additional analysis in which medication was added as a covariate.

Furthermore, reintegration in society is a frequently asked need of patients. It is related to restoring their quality of life and self-esteem. Symptom control with medication is essential for social reintegration, and treatment and social activities need to be considered. Therefore, Study 4 investigated the relationship between physicians' adherence to medication treatment and patients' social activity time. The results showed that the closer the physician's prescription was to the guideline recommendations, the longer the patient's social activity time was. In addition to psychosocial interventions, disseminating guidelines for physicians may contribute to reintegrating patients into society.

Delusions can be seen not only in patients but also in healthy subjects, depending on the content. There have been scales to measure delusions in healthy subjects that inquire about the presence or absence of delusions. However, none have dealt with the context leading up to delusions. Therefore, in Study 5, we developed a scale to measure paranoid thinking and attributional tendencies by presenting illustrations and instructional texts of situations that evoke delusions. As a result of factor analysis, items related to paranoid tendency and internal attributional tendency were combined as the same factor, and external attributional tendency was extracted as a separate factor. The relationship between delusional thinking and internal attributional tendencies and related variables was examined. It was found that the higher the self-esteem and the stronger the tendency toward decentering, one of the metacognitive abilities, the lower the tendency toward delusional thinking. It was found that the higher the tendency toward depression/anxiety and the more the respondent had experienced victimization, the stronger the tendency toward delusional tendencies. The reliability coefficients confirmed the adequate reliability of the scale, and correlations with related variables confirmed the construct validity. This scale was developed for healthy subjects, and its validity has not been confirmed in patient data. However, we will confirm the validity of the scale in the future. It may be possible to provide psycho-educational interventions for patients whose primary delusions have subsided to gain an awareness of their delusional tendencies by measuring their delusional tendencies using the scale and providing them with feedback and reflections on the results.