

## PERSONALITY AND SCHIZOPHRENIA: PSYCHOBIOLOGICAL MODEL AND ITS RELATIONSHIP WITH COMORBIDITY

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### SUMMARY

*Personality interacts with psychosocial variables, psychopathology and coping strategies of patients with schizophrenia. Psychobiological model of personality is important for schizophrenia as temperament dimensions, except dimension Persistence, have been associated with different neurotransmitter systems. Comorbidity of psychiatric and somatic disorders and syndromes is generally associated with dimensions high Harm avoidance and low Self-directedness. Variations in other dimensions may also be important. High Harm Avoidance may represent state vulnerability marker for various psychiatric disorders and is associated with appearance of comorbidity in schizophrenia. High Self-directedness may be protective factor for development of various psychiatric as well somatic comorbidity states.*

**Key words:** schizophrenia – personality - psychobiological model - comorbidity

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### INTRODUCTION

Research of personality correlates is important for understanding the varieties in clinical presentations and outcomes of schizophrenia as well as proneness to certain comorbidity disorders (Reno 2004). According to liability spectrum model personality traits have been shown to account directly to comorbidity patterns. Personality interacts with psychosocial variables, psychopathology and coping strategies of the patients (Kurs et al. 2005, Aukst Margetić & Jakovljević 2008).

The psychobiological model of personality developed by Cloninger et al. (1987) is widely used. It is especially important for schizophrenia as temperament dimensions, except dimension Persistence, have been associated with different neurotransmitter systems which are involved in symptom expression and are main targets of antipsychotics. Generally, a potential role of vulnerability of personality to psychiatric disorder is to cause the disorder, influence its outcome and changes in personality may develop as the result of recurrent illness episodes. It may exist on the continuum as attenuated form of mental disorder (Akisal et. 1983).

The associations of psychobiological model with schizophrenia and its relations to comorbidity will be the scope of this article.

### PSYCHOBIOLOGICAL MODEL

Psychobiological model is based on four temperament and three character dimensions. Temperament factors- Harm Avoidance (HA), Novelty Seeking (NS), Reward Dependence (RD) and Persistence (P) - are considered to be biologically based and highly heritable individual differences in habits and skills.

Character is a developmental construct consisting of self-concepts about the values and goals that influence the significance of what is experienced. Character dimensions: Self-directedness (SD), Cooperativeness (C) and Self-transcendence (ST) mature in response to learning and life experiences and can influence the expression of temperament (Svrakic et al. 2002).

### SPECIFICITY OF PERSONALITY IN SCHIZOPHRENIA

Previous research indicated that schizophrenic patients might have been different from the general population on several dimensions of temperament

and character that revealed stability over time. Personality configurations described in schizophrenia patients are high HA and low NS, RD, SD, C and ST (Ritsner et al. 2003, Kurs et al. 2005, Stompe et al. 1998, Hori et al. 2008). High HA reflects anxious persons prone to pessimism, shyness and fatigability and is associated with high serotonergic activity. It is mentioned as vulnerability marker for schizophrenia as well as other psychiatric disorder as depression and anxiety disorders (Ritsner et al. 2003). Low NS reflects indifferent, detached individuals and is associated with low dopaminergic activity. Low RD reflects persons with insufficient reward system, detached, reserved and cold with low adrenergic activity. Low SD reflects fragile individuals with lack of internal organizational principle and low C corresponds to socially intolerant, unhelpful and destructive individuals (Gullieme 2000, Svrakic 2000). High ST reflects trend to magical ideation and difficulties in self/non-self identifications (Cloninger et al. 1994).

## RELATIONSHIP OF PERSONALITY AND COMORBIDITIES IN SCHIZOPHRENIA

We examined the associations of personality dimensions measured with TCI with symptoms of schizophrenia, most common psychiatric and somatic comorbidities and the implications of these associations.

### Schizophrenia symptoms

There are still many controversies whether any specific psychobiological dimension may be associated with symptom dimensions. So far, the studies show that positive psychotic symptoms were associated with following differences in character: low Self-directedness implies lack of internal organisational principle and high Self-transcendence characterised with magical thinking principle and lack of intrapsychic boundaries. Negative symptoms were associated with changes in temperament: low Reward Dependence, Persistence and Cooperativeness (Hori et al. 2008). Such organisation is in accordance with theories that positive symptoms are adaptive and secondary in nature, occurring to compensate for primary psychopathological mechanism expressed in negative and disorganised symptoms (Gullieme et

al. 2002). High HA was also marker of affective symptoms in schizophrenia (Strakowski et al. 1992).

### Depression

Depressive symptoms in schizophrenia are still unsatisfactorily researched and present one of the biggest dilemmas in the area of the classification. It is unknown if depression is a core schizophrenic symptom or it should be researched as comorbidity disorder (Buckley 2009). The research of depression with psychobiological model generally shows that high Harm Avoidance correlates with intensity of depression (Tanaka et al. 1997) and that lower scores of Harm Avoidance show better reaction to antidepressive treatment (Abrams et al. 2004). Low Self-directedness also was described as character trait associated with depression (Cloninger 1994). Personality dimensions Self-directedness and Harm Avoidance modified a risk for lifetime suicide attempt (Grucza et al. 2005). High HA and low SD are also standard findings in the studies of schizophrenia and personality, but the study of Strakowski et al. (1992) showed that first-psychotic episode schizophrenia patients with high scores of HA may be more prone to present affective-like psychotic symptoms. In a study of temperament in euthymic bipolar patients Osher et al. reported low P, high HA and high RD (Osher et al. 1996). HA seems to be related with depressive or negative PANSS dimension in the study of Cortes et al. (2009).

### Obsessive-compulsive disorder and symptoms

Obsessive-compulsive disorder (OCD) is currently classified as anxiety disorder, but it has high comorbidity rates. The research has emphasized the role of corticostrially mediated control and reward systems, and involvement of serotonergic and dopaminergic dysfunction as etiological factors. The failures of behavioral (cognitive and motor) inhibition constitute a key characteristic of OCD (Fineberg et al., 2007). The studies that examined psychobiological model in OCD reported higher scores on the Harm Avoidance dimension (Bejerot et al. 1998, Kusunoki et al. 2000). Kusunoki et al. (2000) differentiated OCD from major depression on the basis of low NS. High RD, low SD and C were also described (Bejerot et al. 1998, Kusunoki et al. 2000). Such diversities in association with particular

dimensions could be associated with comorbidity of OCD. Co-occurrence of OCD, bizarre grooming, and hoarding in schizophrenia is well recognized. It remains unclear whether the observed overrepresentation of obsessive-compulsive symptoms in schizophrenia reflects true comorbidity, more severe illness, or distinct neuropsychological substrates unique to this group. Personality studies point towards differentiation from depression based on low NS both in schizophrenia and OCD. These two disorders share high HA, low NS, SD and C, but differ in RD dimension which is low in schizophrenia.

### Substance abuse

Comorbidity of substance dependence in schizophrenia is well researched and increase risk for suicide and worse outcomes. A number of longitudinal studies have shown Novelty Seeking (a disinhibitory personality trait) to be antecedent of substance use, abuse, and dependence (Reno, 2004; Grucza et al. 2006). High Novelty Seeking person can have a trend for new experiences with drugs (Grucza et al. 2006), and some drugs are well-known psychosis triggers (Bühler et al. 2002). Novelty seeking is associated with smoking and heavy caffeine abuses which are more common in schizophrenia patients and add to health risks (Gurpegui et al. 2007). Variations in Novelty seeking account for a notable percentage of the comorbidity including conduct disorder and antisocial behaviour.

### Shizotypy in psychobiological model

The term shizotaxia describes genetic predisposition of a person to develop schizophrenia or shizotypal personality disorder dependent on environmental influences. It is represented in 50% relatives of schizophrenic persons and in 10% it develops to shizotypy (Danelluso et al. 2005). This concept is particularly relevant to be explored with psychobiological model. Schizotypy could be viewed as a latent construct of an underlying personality organization that includes the liability to schizophrenia or to a more generally non-specific psychosis-proneness. On the other hand, schizotypic could be referred as shizotypal personality disorder and corresponds to the phenotypic manifestations of a particular personality organization, such as mildly disordered thought, peculiar use of language, interpersonal aversiveness,

anxiety, odd-eccentric behaviour and appearance. Schizotypal personality disorder and general schizotypy (neutral with respect to pathology) seem to be connected and are both more common in patients' relatives (Bental 2003). Psychobiological model describes high Harm Avoidance, low Self-directedness and high Self-transcendence as personality dimensions associated with shizotypy (Cloninger et al. 1994). This type of personality organisation was found to be more common also in schizophrenia first-degree relatives (Bora 2007). Longitudinal studies that could clear if such type of organisation leads to schizophrenia as transitive or is a stable construct are needed.

### Somatic comorbidity

Body mass index (BMI) is related to higher scores of Harm Avoidance and lower scores of Self-directedness in healthy female, but not male, subjects. These dimensions are associated to proneness to more fatigability that leads to less physical activity and to high blood pressure (Sovio et al. 2007). High HA and low SD are also traits associated with vulnerability to schizophrenia (Hori et al. 2008). Schizophrenic patients are prone to obesity and metabolic syndrome development independently from antipsychotics usage. They also smoke more (Gurpegui et al. 2007). Relations between weight gain, metabolic syndrome and personality are not studied in schizophrenia patients yet. Increased cannabis use, except being a psychosis trigger, has been associated with increased body weight and blood glucose levels, contributing to increased metabolic dysbalance seen in schizophrenia (Mushtaq et al. 2008). Metabolic side-effects of antipsychotics may be under influence of temperamental factors as well.

### CONCLUSION

Comorbidity of psychiatric and somatic disorders and syndromes is generally associated with high Harm avoidance and low Self-directedness. Variations in other dimensions may also be important. High Harm Avoidance may represent state vulnerability marker for various psychiatric disorders and is associated with clinical presentation and comorbidity appearance in schizophrenia. SD may be protective factor for development of various psychiatric as well somatic states in comorbidity.

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