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Comparison of psychopathology of schizophrenia ill patients with hyponatremia or normonatremia on hospital admission

Porównanie obrazu psychopatologicznego u chorych na schizofrenię z hiponatremią lub normonatremią przy przyjęciu do szpitala

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ABSTRACT

Purpose: A comparison of differences in the psychopathological profile in aggravated schizophrenia patients with hyponatremia or normonatremia on hospital admission or at hospital discharge. **Method:** The mental state in 11 patients with schizophrenia and hyponatremia on hospital admission was compared to mental state in 22 patients with schizophrenia and normonatremia on hospital admission being a control group. The comparison included all patients from hyponatremia and normonatremia groups, and then 11 pairs chosen from among them and matched for age and sex. The mental state of patients was assessed twice, at the beginning and at the end of hospitalisation using the following scales: clinical global impression (CGI) scale, detailed Mental State Assessment (*Przegląd Stanu Psychicznego*; PSP) scale – a Polish modification of the German AMDP system, as well as three scales profiled to measure positive and negative syndromes of psychosis (PANSS), depressive symptoms in schizophrenia (CDSS) and mania symptoms (BRMAS). **Results:** The clinical global impression (CGI) only at the hospital discharge and only in the case of comparison in pairs indicated greater severity of disorders in patients with hyponatremia. The total score of the assessment according to PSP/AMDP did not favour patients with hyponatremia, while the detailed assessment – both when comparing groups and pairs – indicated greater severity of consciousness and orientation disorders observed at the beginning of hospitalisation and remaining at the end of hospitalisation. In the group without hyponatremia, the PSP/AMDP assessment revealed greater

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severity of delusions as well as affective and anxiety symptoms, but only at the beginning of hospitalisation. The results of the assessment of psychotic symptoms according to PANSS, depressive symptoms according to CDSS and mania symptoms according to BRMAS did not show any significant differences depending on the presence of hyponatremia. **Conclusions:** The results suggest that consciousness and orientation disorders may be the only hyponatremia-related feature distinguishing schizophrenia patients with hyponatremia diagnosed on the hospital admission, which retains its influence throughout hospitalisation. The clinical impression also suggests worse results as far as treatment of these patients is concerned.

Acute psychosis can cause fluctuating urine concentration disorders. Exacerbation of schizophrenia is often accompanied by urine dilution (a bimodal distribution of urine osmolality with the limit value of 219 mOsm/kg H_2O was described) [1]. Psychosis-induced hyponatremia occurs four times more frequently in patients with urine dilution [2].

Acute psychosis reduces the level of osmotic regulation (set-point) of secretion of antidiuretic hormone, inducing dangerous water retention in the body even in the case of mild hyponatremia (a reset osmostat syndrome). The main reason is probably intensified stress accompanying psychosis [3, 4]. The response of antidiuretic hormone to psychological stress is enhanced in patients with polydipsia and hyponatremia, similar as in the case of healthy subjects and patients with polydipsia and without hyponatremia, and weakened in patients without polydipsia. The influence of psychological stress on the secretion of antidiuretic hormone in the hyponatremia subgroup is thus similar to the effects of acute psychosis, i.e. it further reduces the value of the regulation level [5, 6]. In some patients with chronic schizophrenia, exacerbation of psychosis may impair excretion of water and contribute to water intoxication. The temporal lobe dysfunction participation in the pathogenesis of this phenomenon was suggested, indicating a decrease in volume of the hippocampus and amygdala in patients with schizophrenia, polydipsia and intermittent hyponatremia [7].

Polydipsia increases with the severity of psychosis and is attenuated with the remission of symptoms [8]. However, there were reports about the lack of correlation between the increase in positive symptoms and sodium plasma concentrations in patients with schizophrenia and polyuria [5], and about more severe course of schizophrenia in patients with polydipsia [9]. In one study, schizophrenia patients with polydipsia and hyponatremia did not differ from patients with polydipsia and without hyponatremia as far as the total PANSS scale score is concerned [10]. In other paper, in the course of hyponatremia, during a fluid loading test, there was no statistically significant difference as far as the total BPRS scale score is concerned [11]. Also in more recent studies no significant difference was observed as far as PANSS score is concerned in patients with schizophrenia and polydipsia [12]. In one of the few detailed studies of the psychopathological profile in young (11–24 years old) patients suffering from schizophrenia for a short period of time or with the obsessive-compulsive disorder (OCD), the severity of positive and negative symptoms (measured using SANS and SAPS scales) was compared in subgroups with intensified and poorly expressed positive symptoms. Patients with schizophrenia excreted more urine than healthy subjects and OCD group patients. Schizophrenia patients were divided into two subgroups using the SAPS scale score median. Both subgroups were characterised by similar severity of negative symptoms and the volume of consumed fluids did not depend on the severity of psychosis symptoms. However, in the case of the group with increased positive symptoms, high BPRS scores were accompanied by a decrease in the volume of secreted urine [13].

Higher prevalence of polydipsia and water intoxication was first described in the population of patients with chronic schizophrenia characterised by a significant increase in negative and cognitive symptoms (the so-called Kraepelinian subtype), long-term hospitalisation, no remission of symptoms in recent years and unemployment (the so-called Keefe criteria). In one of the papers [14], the severity of psychotic symptoms was measured using the PANSS scale (total score and five subscales) in persons meeting the above-mentioned criteria. Schizophrenia patients with polydipsia and hyponatremia did not differ as far as the severity of positive and depressive-anxiety symptoms are concerned, while there were differences in terms of negative, disorganisation and general symptoms. Again, the differentiating significance of positive symptoms in patients with hyponatremia was not confirmed.

Hyponatremia may also accompany catatonia [15, 16]. In recent case report [16], no correlation between the severity of catatonic symptoms and sodium concentration in serum was observed.

Purpose

The aim was to assess the profile and severity of psychopathological symptoms in patients with schizophrenia and hyponatremia (study group) or normonatremia (control group) on psychiatric hospital admission and at discharge. This assessment is part of a broader hyponatremia study programme [17].