

SYMPTOM CORRELATIONS OF ORGANIC BRAIN IMPAIRMENT AND PSYCHOPATHOLOGY IN PATIENTS WITH RESIDUAL SCHIZOPHRENIA

D. N. Safonov

Zaporozhye State Medical University, Ukraine

Abstract

Relevance. Organic brain impairment (OBI) is one of the most well studied comorbid pathology to schizophrenia. Nevertheless it is not clear yet, how it influences some structural and dynamic aspects of main pathology, such as positive symptoms variability and intensity or negative symptoms progression.

Aim – to analyze influence of most common types of organic brain impairment and intensity of residual schizophrenia symptoms. **Materials and methods.** A study was performed on 100 case histories of patients of Zaporozhye Regional Clinical Psychiatric Hospital who were treated as inpatients with diagnosis of recurrent schizophrenia (ICD-10:F20.5) in time period from 2010 to 2020. **Results.** On the first stage of a study we studied contingent's medical history focusing on probable organic brain impairment inducing factors: cerebrovascular catastrophes, cerebrovascular diseases and cerebrovascular conditions. We gathered clinical data on intensity of main positive and negative recurrent schizophrenia symptoms. Among positive symptoms rating in study contingent only conceptual disorganization reaches moderate level of intensity. Negative symptoms among studied patients have higher average intensity than positive with evenly moderate levels with exceptions of difficulty in abstract thinking and stereotyped thinking. We analyzed correlations between organic brain impairment inducing factors and positive and negative syndromes scale categories intensity rating. For correlation statistical interpretation we used

Chaddock scale. Only weak correlations were found between positive symptom ratings and OBI inducing factors correlations both positive and negative. For negative symptom ratings we have found all weak correlations but one (traumatic brain injury have moderate negative correlation with conceptual disorganization). **Conclusions.** Analysis of correlations between organic brain impairment inducing factors with positive and negative symptoms revealed controversial data but definitely demonstrated presence of weak up to moderate influence of organic brain impairment on positive and negative symptom intensity. However this influence is both positive and negative according to specific symptom as well as specific organic brain impairment variant.

Key words: organic brain impairment; schizophrenia; behavioral representation; cerebrovascular catastrophe; symptom intensity.

Relevance. Organic brain impairment (OBI) is one of the most well studied comorbid pathology to schizophrenia. Nevertheless it is not clear yet, how it influences some structural and dynamic aspects of main pathology, such as positive symptoms variability and intensity or negative symptoms progression [1, 6].

Historical retrospective reveals empirical findings of leveling effects of organic brain impairment on acute psychotic manifestations, what was widely exploited in pre-neuroleptic era of psychiatry, including notorious practice of lobotomy. Studies of psychiatric comorbidity dedicated to combinations of schizophrenia and epilepsy (“Schizoepilepsy”) or alcoholism (“Gretter’s schizophrenia”) declared the presence of so called “forced normalization” which presented by comparatively milder schizophrenia manifestations in cases with clear organic comorbidity what refers to both positive and negative symptoms. However these findings have no systematic evidences but based majorly on specialists experience and separated case reports [1, 6 – 9].

Recent studies revealed various risk factors of organic brain impairment that are specific for schizophrenia, such as antipsychotic systematic use, low potential of early involvement into preventive treatment programs, abnormal lifestyle, eating habits, physical activity level and various behavioral risks [2 – 5].

Many of schizophrenia manifestations have behavioral representation that hard to distinguish from organic brain impairment consequences particularly those that involve frontal and temporal cortex or have diffuse type. This makes attempts to establish correlations between specific types of organic brain impairment and recurrent schizophrenia symptoms

perspective in key of development our understanding of nature of schizophrenic impact on mental functions.

Aim – to analyze influence of most common types of organic brain impairment and intensity of residual schizophrenia symptoms.

Materials and methods. A study was performed on 100 case histories of patients of Zaporozhye Regional Clinical Psychiatric Hospital who were treated as inpatients with diagnosis of recurrent schizophrenia (ICD-10:F20.5) in time period from 2010 to 2020. Gender distribution is 43 (71,7%) male and 17 (28,4%) female patients. Mean study-relevant age is 55,0±13,1 years, mean disease experience is 31,2±13,1 years, mean clinical manifestation age is 24,1±8,9 years.

Contingent schizophrenia medical history features presented in table 1

Table 1

Contingent schizophrenia medical history features rating

Schizophrenia medical history	Feature Prevalence	
	n	%
Simple form (ICD-10:F20.6) prior to recurrent	3	3,0
Paranoid form (ICD-10:F20.0) prior to recurrent	92	92,0
Catatonic form (ICD-10:F20.2) prior to recurrent	2	2,0
Hebephrenic form (ICD-10:F20.1) prior to recurrent	1	1,0
Constantly progressive dynamic type	87	87,0
Paroxysmal-progressive dynamic type	5	5,0
Paroxysmal dynamic type	8	8,0
Full (“type A”) remissions were consistent	1	1,0
Partial (“type B”) remissions were consistent	9	9,0
Minor (“type C”) remissions were consistent	58	58,0
Remissions were absent	32	32,0
2 or more annual hospitalizations stereotype	24	24,0
1 annual hospitalization stereotype	34	34,0
Less than 1 annual hospitalization stereotype	40	40,0

Main methods of a study are clinical data evaluation using criteria and diagnostic categories of “Positive and negative syndrome scale” and statistical analysis.

Results. On the first stage of the research we studied contingent’s medical history focusing on probable OBI inducing factors: cerebrovascular (CV) catastrophes (ischemic stroke in anterior / medial / posterior meningeal areas and recurrent stroke), CV diseases (Cerebral atherosclerosis, arterial hypertension of 1 / 2 / 3 stages, minor diffuse brain impairment) and CV conditions (traumatic brain injury, cases of asphyxia and encephalitis); that presented in table 2.

Table 2.

Contingent OBI inducing factors rating

OBI inducing factors	Prevalence	
	n	%
CV catastrophes		
Ischemic stroke in anterior meningeal area	6	6,0
Ischemic stroke in medial meningeal area	9	9,0
Ischemic stroke in posterior meningeal area	5	5,0
Ischemic stroke in vertebrobasilar area	5	5,0
Recurrent ischemic stroke	4	4,0
Cumulative cerebrovascular catastrophes	27	27,0
CV diseases		
Cerebral atherosclerosis	8	8,0
Arterial hypertension 1 stage	5	5,0
Arterial hypertension 2 stage	13	13,0
Arterial hypertension 3 stage	2	2,0
Cumulative cerebrovascular diseases	26	26,0
CV conditions		
Traumatic brain injury	28	28,0
Asphyxia	8	8,0
Encephalitis	4	4,0
Minor diffuse brain impairment (encephalopathy)	27	27,0
Cumulative specific conditions	39	39,0
Summarized data		
OBI inducing factors present	76	76,0
OBI inducing factors absent	24	24,0

On the next stage of a study we gathered clinical data on intensity of main positive and negative recurrent schizophrenia symptoms using as a clinical tools PSS and NSS subscales of PANSS (table 3 and 4).

Table 3

Contingent PSS rating

Tag	Symptom	M	m
P1	Delusions	2,0	0,5
P2	Conceptual disorganization	4,3	0,3
P3	Hallucinations	2,0	0,5
P4	Excitement	2,4	0,4
P5	Grandiosity	1,2	0,2
P6	Suspiciousness/persecution	2,0	0,4
P7	Hostility	2,0	0,3

Among positive symptoms rating in study contingent only conceptual disorganization (4,3±0,3) reaches moderate level of intensity, what represents the specific recurrent condition

of patients with pronounced reduction of major part of positive schizophrenia manifestations.

Table 4

Contingent NSS rating

Tag	Symptom	M	m
N1	Blunted affect	4,3	0,2
N2	Emotional withdrawal	3,9	0,4
N3	Poor rapport	3,8	0,3
N4	Passive/apathetic social withdrawal	3,6	0,3
N5	Difficulty in abstract thinking	2,9	0,3
N6	Lack of spontaneity and flow of conversation	3,1	0,3
N7	Stereotyped thinking	2,4	0,4

Negative symptoms among studied patients have higher average intensity than positive with evenly moderate levels with exceptions of difficulty in abstract thinking ($2,9\pm 0,3$) and stereotyped thinking ($2,4\pm 0,4$).

On the next stage we analyzed correlations between OBI inducing factors and PANSS categories intensity rating (table 5 and 6). For correlation statistical interpretation we used Chaddock scale.

Table 5

PSS ratings and OBI inducing factors correlations

		PSS	P1	P2	P3	P4	P5	P6	P7
CV catastrophes	anterior area stroke	0,01	-0,15	0,18	-0,02	-0,02	0,01	0,06	
	medial area stroke	-0,10	0,09	0,07	0,01	-0,11	-0,08	0,05	
	posterior area stroke	0,08	-0,10	0,10	0,03	0,05	-0,03	-0,01	
	vertebrobasillar stroke	0,11	0,08	0,03	0,10	-0,08	0,07	0,07	
	recurrent tstroke	0,01	0,10	0,01	0,09	-0,07	0,08	0,03	
CV diseases	cerebral atherosclerosis	-0,02	-0,09	-0,12	-0,04	0,06	0,12	0,05	
	arterial hypertension 1	0,11	-0,03	-0,09	-0,01	0,05	-0,07	-0,11	
	arterial hypertension 2	0,27	-0,06	0,09	0,08	0,12	0,10	0,06	
	arterial hypertension 3	0,06	0,07	-0,04	0,18	0,26	0,05	0,11	
CV conditions	traumatic brain injury	-0,02	0,02	-0,05	0,01	0,01	-0,01	-0,01	
	asphyxia	-0,17	0,07	0,01	-0,07	-0,10	-0,08	-0,01	
	encephalitis	-0,03	-0,13	-0,10	0,01	-0,07	-0,08	-0,04	
	minor brain impairments	0,08	-0,10	-0,13	-0,03	0,14	0,05	-0,04	

Only weak correlations were found between PSS ratings and OBI inducing factors correlations both positive and negative.

Delusions have controversial correlations with OBI inducing factors, ischemic stroke in medial meningeal area and arterial hypertension (2 stage) are correlated with increased intensity when ischemic stroke in vertebrobasillar area and asphyxia seem to be correlated with decreased intensity. Conceptual disorganization showed only negative correlations with ischemic stroke in anterior and posterior meningeal area and encephalitis and minor brain impairments. Hallucinations are positively correlated with ischemic stroke in anterior and posterior meningeal area and negatively with cerebral atherosclerosis, encephalitis and minor brain impairments. Excitement seems to have only one positive correlation with arterial hypertension (3 stage). Grandiosity positively correlated with arterial hypertension (2 and 3 stages) and minor brain impairments and negatively with ischemic stroke in medial meningeal area and asphyxia. Suspiciousness/persecution has only positive correlations with cerebral atherosclerosis and arterial hypertension (2 stage). Hostility has positive correlation with arterial hypertension (1 stage) and negative with arterial hypertension (3 stage).

Table 6

NSS ratings and OBI inducing factors correlations

OBI factors		NSS	N1	N2	N3	N4	N5	N6	N7
CV	catastrophes								
	anterior area stroke	-0,07	-0,07	-0,22	-0,04	-0,02	-0,07	-0,12	
	medial area stroke	0,01	0,10	0,02	0,09	-0,11	0,01	0,01	
	posterior area stroke	-0,04	-0,11	-0,06	0,11	-0,03	-0,16	-0,15	
	vertebrobasillar stroke	-0,10	0,06	-0,15	-0,08	-0,11	-0,07	-0,00	
	recurrent stroke	-0,03	0,07	0,01	-0,01	0,01	0,15	-0,07	
CV	diseases								
	cerebral atherosclerosis	0,07	0,10	0,12	0,04	-0,08	0,05	0,01	
	arterial hypertension 1	0,05	0,06	0,05	-0,11	-0,07	-0,04	0,03	
	arterial hypertension 2	-0,01	-0,12	-0,08	-0,01	-0,09	-0,10	-0,11	
	arterial hypertension 3	-0,07	0,01	-0,03	-0,13	-0,06	0,03	0,06	
CV	conditions								
	traumatic brain injury	-0,10	-0,35	-0,05	-0,10	-0,00	-0,16	0,04	
	asphyxia	-0,05	-0,04	0,02	-0,01	0,15	-0,04	-0,01	
	encephalitis	-0,10	0,07	0,01	-0,19	-0,08	0,05	-0,11	
	minor brain impairments	0,08	0,06	0,11	-0,01	-0,07	0,06	-0,19	

For NSS ratings we have found all weak correlations but one (traumatic brain injury have moderate negative correlation with conceptual disorganization).

Blunted affect has only negative correlations: with ischemic stroke in vertebrobasillar area, traumatic brain injury and encephalitis. Conceptual disorganization has positive correlations: with ischemic stroke in medial meningeal area and cerebral atherosclerosis; negative: with ischemic stroke in medial meningeal area, arterial hypertension (2 stage) and traumatic brain injury. Poor rapport negatively correlated with ischemic stroke in medial and

posterior meningeal areas and positively with cerebral atherosclerosis and minor brain impairments. Passive/apathetic social withdrawal demonstrated negative correlations: with arterial hypertension (1 and 3 stages), traumatic brain injury and encephalitis; positive with ischemic stroke in posterior meningeal area. Difficulty in abstract thinking negatively correlated with ischemic stroke in medial meningeal and vertebrobasillar areas, positively with asphyxia. Lack of spontaneity and flow of conversation negatively correlated with ischemic stroke in posterior meningeal area, arterial hypertension (2 stage) and traumatic brain injury and positive with recurrent ischemic stroke. Stereotyped thinking revealed only negative correlations: with ischemic stroke in anterior and posterior meningeal areas, arterial hypertension (2 stage), encephalitis and minor brain impairments.

Conclusions. Study revealed prevalence of organic brain impairment inducing factors among contingent of 100 patients with diagnosis of recurrent schizophrenia (ICD-10:F20.5) as well as established positive and negative symptoms intensity in contingent. Analysis of correlations between organic brain impairment inducing factors with positive and negative symptoms revealed controversial data but definitely demonstrated presence of weak up to moderate influence of organic brain impairment on positive and negative symptom intensity. However this influence is both positive and negative according to specific symptom as well as specific organic brain impairment variant.

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