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Differential diagnosis algorithm of endogenous catatonia, catatonia-morphic and catatonia-mimicking states

D. N. Safonov

Zaporizhzhia State Medical University, Ukraine

Subject relevance. The process of mental pathology pathomorphosis leads to the polymorphism of its clinical manifestations and, as a consequence – to difficulties in identification and differential diagnosis. The solution to this problem is in the adaption of diagnostic methodology to clinical realities by including into their structure instruments formed basing on pathomorphosis factors and trends. In this perspective, the most prominent example is endogenous catatonia, which in the academic tradition is conventionally affiliated with the form of schizophrenia with the same name. According to the classical understanding, endogenous catatonia, or, in the narrow sense – catatonic syndrome, is a group of intermittent motor disorders, arranged with polymorphic shell constellation of neuropsychiatric manifestations.

The aim is to develop pathomorphosis adapted clinical algorithm of endogenous catatonia differential diagnostics.

Materials and methods: 236 patients of Zaporizhzhia Regional Psychiatric Clinic were examined. Patients were divided into groups due to their mental disorders:

– core group: patients with elements of endogenous catatonia in the structure of different clinical forms of schizophrenia (there were 144 patients in this group);

– comparison group # 1: 69 patients with late neurotropic effects of neuroleptic therapy (LNENT);

– comparison group # 2: 103 patients with catatonia-morphic dissociative disorders (CDD);

– comparison group # 3: 90 patients with organic catatonic disorder (OrCD);

Results. Using Bush-Francis Catatonia Rating scale as an instrument of clinical analysis and statistical research of results with A. Wald's sequential analysis (modificated by E. V. Gubler) an algorithm of differential diagnostics of endogenus catatonia which includes 3 steps of Recognition Scale for Endogenous Catatonia is developed.

Conclusion. Designed scales have a number of categorical differences from existing analogues, foremost by virtue of specificity of clinical-discursion compositions of using marks and disqualified conditions and excluding phenomena spectrum availability. The validity level: true positive diagnostic results (sensibility) = 94.43 %, pseudo-negative = 5.56 %, true negative (specificity) = 90.00 %, pseudo-positive = 10.00 %.

Key words: catatonia, diagnosis, algorithms.

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E-mail: doxtor15@gmail.com

Алгоритм диференційної діагностики ендогенної кататонії, кататономорфних та кататономімікричних станів

Д. М. Сафонов

Процес патоморфозу психічної патології призводить до поліморфізму її клінічних проявів та, як наслідок, – до труднощів в ідентифікації та диференціальній діагностиці. Вирішення цієї проблеми полягає в адаптації діагностичних методик до клінічних реалій шляхом включення до їхнього складу інструментів, що сформовані на основі факторів патоморфозу та його тенденцій. З цього погляду найяскравішим прикладом є ендогенна кататонія, яка в академічній традиції, зазвичай, пов'язується з однойменною формою шизофренії. Відповідно до класичного розуміння, ендогенна кататонія або, у вузькому сенсі, кататонічний синдром є групою моторних порушень із поліморфною оболонкою психоневрологічного порядку.

Мета роботи – розробка патоморфоз-адаптованого клінічного алгоритму диференціальної діагностики ендогенної кататонії.

Матеріали та методи. Обстежили 236 пацієнтів Запорізької обласної психіатричної лікарні. Пацієнтів поділили на групи в зв'язку з їхніми психічними розладами:

– основна група: хворі з елементами ендогенної кататонії у структурі різних клінічних форм шизофренії (144 хворі);

– група порівняння № 1: 69 пацієнтів із пізніми нейротропними ефектами нейролептичної терапії (ПНЕНТ);

– група порівняння № 2: 103 хворі з кататономорфними дисоціативними розладами (КДР);

– група порівняння № 3: 90 хворих з органічним кататонічним розладом (ОрКР).

Результати. Використання клінічної шкали Буша–Френсіса як інструмента клінічного аналізу та статистичного дослідження результатів у рамках подвійного послідовного аналізу А. Вальда (модифікованого Є. В. Гублером) призвело до створення алгоритму диференціальної діагностики ендогенної кататонії, котра містить 3 кроки використання «Шкали розрізнення ендогенної кататонії» («ШРЕК»).

Висновки. Розроблена шкала має низку категоріальних відмінностей від наявних аналогів передусім через специфіку клініко-дискурсивних композицій із використанням маркерів і дискваліфікуючих станів. Рівень валідності: істинно позитивні результати діагностики (чутливість) = 94,43 %, псевдонегативні = 5,56 %, істинно негативні (специфічність) = 90,00 %, псевдопозитивні = 10,00 %.

Ключові слова: кататонічний синдром, ендогенна кататонія, органічна кататонія, діагностика, алгоритм.

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Ключевые слова: кататонический синдром, эндогенная кататония, органическая кататония, диагностика, алгоритм.

Патология. – 2017. – Т. 14, № 2(40). – С. 177–181

Алгоритм дифференциальной диагностики эндогенной кататонии, кататономорфных и кататономимикрических состояний

Д. Н. Сафонов

Процесс патоморфоза психической патологии приводит к полиморфизму её клинических проявлений и, как следствие, – к трудностям в идентификации и дифференциальной диагностике. Решение этой проблемы заключается в адаптации диагностических методик к клиническим реалиям путем включения в их состав инструментов, сформированных на основе факторов патоморфоза и его тенденций. С этой точки зрения наиболее ярким примером является эндогенная кататония, которая в академической традиции обычно связывается с одноименной формой шизофрении. Согласно классическому пониманию, эндогенная кататония или, в узком смысле, кататонический синдром, является группой моторных нарушений с полиморфной оболочкой психоневрологического порядка.

Цель работы – разработка патоморфоз-адаптированного клинического алгоритма дифференциальной диагностики эндогенной кататонии.

Материалы и методы. Обследовано 236 пациентов Запорожской областной психиатрической больницы. Пациенты были разделены на группы в связи с их психическими расстройствами:

– основная группа: больные с элементами эндогенной кататонии в структуре различных клинических форм шизофрении (144 больных);

– группа сравнения № 1: 69 пациентов с поздними нейротропными эффектами нейролептической терапии (ПНЭНТ);

– группа сравнения № 2: 103 больных с кататономорфными диссоциативными расстройствами (КДР);

– группа сравнения № 3: 90 больных с органическими кататоническими расстройствами (ОрКР).

Результаты. Использование клинической шкалы Буша–Френсиса в качестве инструмента клинического анализа и статистического исследования результатов в рамках двойного последовательного анализа А. Вальда (модифицированного Е. В. Гублером) привело к созданию алгоритма дифференциальной диагностики эндогенной кататонии, которая включает в себя 3 шага применения «Шкалы различения эндогенной кататонии» («ШРЭК»).

Выводы. Разработанная шкала имеет ряд категориальных отличий от существующих аналогов, прежде всего в силу специфики клинико-дискурсивных композиций с использованием маркеров и дисквалифицирующих состояний. Уровень валидности: истинно положительные результаты диагностики (чувствительность) = 94,43 %, псевдоотрицательные = 5,56 %, истинно отрицательные (специфичность) = 90,00 %, псевдоположительные = 10,00 %.

Subject relevance

The process of mental pathology pathomorphosis (PM) leads to polymorphism of its clinical manifestations and, as a consequence – to difficulties in identification and differential diagnosis. The solution to this problem is in the adaption of diagnostic methodology to clinical realities by including into their structure instruments formed basing on PM factors and trends [18–22].

In this perspective, the most prominent example is endogenous catatonia (EC), which in the academic tradition conventionally is affiliated with the form of schizophrenia with the same name. According to the classical understanding, EC, or, in the narrow sense – catatonic syndrome (CS), is a group of intermittent motor disorders, arranged with polymorphic shell constellation of neuropsychiatric manifestations [1,2,19–22].

With psychiatric diagnosis formalization degree incensement, as a result of adaptation to the requirements of evidence-based medicine, which is typical of the international psychiatric discourse of XXI century, diagnostic algorithms that provide specialized diagnostic scales have been established in clinical practice, including: Rosebush and colleagues scale (1999), The Modified Rogers Scale (MRS, 1991), Bush-Francis Catatonia Rating Scale (BFCRS, 1996), Northoff Catatonia Scale (NCS, 1999), Catatonia Rating Scale (CRS, 2008). Analysis of scales above finds lack of signs that are specific to EC structure, contamination of diagnostic positions and replication of same phenomena. That leads to discursive heterogeneity and artificial etiopatogenetic homogenization, without any formal system of adaptation to EC PM [3–15].

In this regard, the development of PM adapted diagnostic tool for EC differentiation is an urgent task of modern clinical psychiatry.

The aim of this study is to develop pathomorphosis adapted clinical algorithm of endogenous catatonia differential diagnostics.

The research design and basic features of contingents and methods

453 patients struggling catatonia and behavior disorders of different genesis have been examined on the basis of the Zaporizhzhia Regional Psychiatric Clinic. For further examination 236 patients were chosen by prevailing criteria (primarily by the nosology). All the patients have been hospitalized in stable somatic state due to psycho-somatic examination. The duration of the disorder takes from 5 to 30 years. The average age of patient was approximately 34 years.

Patients were divided into groups due to their mental disorders:

– core group: patients with elements of endogenous catatonia in the structure of different clinical form of schizophrenia (there are 144 patients in this group);

– comparison group # 1: 69 patients with late neurotropic effects of neuroleptic therapy (LNENT);

– comparison group # 2: 103 patients with catatonomorphic dissociative disorders (CDD);

– comparison group # 3: 90 patients with organic catatonic disorder (OrCD);

On the stage of testing diagnostic tool sensitivity and specificity, 30 patients with schizophrenia disorder with excluded phenomena of catatonic range were included to the comparison group.

Following research methods were used:

– psycho-pathological method – used for identification of disorder due to ICD-10 and analysis of its course with the help of the diagnostic scales (PANSS / Bush-Francis Catatonia Rating Scale (G. Bush, M. Fink, G. Petrides, 1996) [16,17];

– catamnestic method – analysis of new diagnostic specificity, determine the effectiveness of the developed differential diagnostics tool.

– clinical and statistical methods – were used for research results processing and assessment of the results' authenticity. All calculations were implemented on PC by dint of SPSS 15.0 and Excel programs from Microsoft Office 2003 pack. There a designation and arithmetical mean and variations were conducted for every quantitative indicator M (s), standardized mistakes of average M ± m, Student's criterion for quantitative indicators, unified signification of statistical probability p, diagnostic value grade (of diagnostic coefficients (DC) and Kullback's informativeness measure (IM)) an a part of A. Wald's sequential analysis (modificated by E. V. Gubler). Statistic manipulations of research results were implemented on PC by Excel programs from Microsoft Office 2003 pack.

Research results

Comparative analysis of the endogenous catatonia symptoms occurrence was performed with different representative of the comparison group, videlicet:

– LNENT [20] (*Table 1*);

– CDD [21] (*Table 2*);

– OrCD [22] (*Table 3*).

With DC and IM calculations by the formulas (E. V. Gubler, 1978);

$$DC = 10\lg\frac{A_1}{A_2}; \quad (1)$$

$$IM = 10\lg\frac{A_1}{A_2} \times 0.5\,[A_1 - A_2]; \quad (2)$$

where: DC – diagnostic coefficient;

IM – Kullback's informativeness measure;

A1 – sign frequency in comparison group # 1;

A2 – sign frequency in comparison group # 2.

All important signs were made into differential-diagnostic tables (step 1, 2 and 3 ECDS) and posted in descending order of informativeness:

Filling scales of clinical forms was based on consistent observation and registration of psychopathological phenomena, postural and facial features, articulation, content, emphatic intonational-verbal communication parameters, neurological stigmas and complex patterns of behavior.

"Yes" mark was put in table in case of the phenomena presence, "No" mark was put in table in case of phenomena absence. On filling each line, the amount calculation of DC has been produced. By dint of mark DC addition, reaching value of $\sum_{DC}$ = +13 or -13, imposed preliminary diagnostic

Table 1. ECDS, step 1 – form (differentiation of EC and LNENT) [20]

Sign (mark)	Yes	No	$\sum_{DC}$
negativism (passive)	-5.66	+9.05	
impulsive actions	-6.35	+8.05	
echophenomena	-6.19	+7.08	
retrograde amnesia	-8.31	+4.59	
paramimia	-6.73	+5.27	
autoagression	-9.13	+3.59	
catalepsy	-7.02	+4.03	
solidification	-8.11	+3.20	
oneiric	-13.75	+1.77	
stupor	-7.60	+2.62	
negativism (active)	-7.32	+2.35	
stereotyped movements	-6.10	+2.68	
tremor at rest	+6.94	-2.28	
autonomic disorders	+9.67	-1.35	
agression	+7.45	-1.58	
motor automatisms	-5.77	+1.96	
mutism	-6.03	+1.80	
choreoathetosis	+6.87	-1.30	
dystonia	+5.51	-1.33	
rigidity	-4.43	+0.97	

Table 2. ECDS, step 2 – form (differentiation of EC and CDD) [21]

Sign (mark)	Yes	No	$\sum_{DC}$
echophenomena	-8.60	+7.52	
impulsiveness	-5.08	+7.65	
autoagression	-8.83	+3.56	
stupor	-8.09	+2.66	
negativism	-7.58	+2.46	
paramimia	-4.83	+2.46	
tremor	+5.71	-1.44	
demonstrativeness	+5.59	-1.38	
stereotypy	-3.23	+2.03	
autonomic disorders	+2.33	-1.69	
dyspnea	+3.82	-0.98	

Table 3. ECDS, step 3 – form (differentiation of EC and OrCD) [22]

Sign (mark)	Yes	No	$\sum_{DC}$
negativism (passive)	-5.31	+8.93	
impulsive actions	-5.74	+7.88	
tremor at rest	+7.81	-3.20	
catalepsy	-5.41	+3.73	
solidification	-6.25	+2.97	
paramimia	-3.38	+4.19	
echophenomena	-2.27	+5.05	
negativism (active)	-4.79	+2.01	
oneiric	-6.45	+1.48	
stupor	-4.23	+2.10	
mutism	-5.22	+1.70	
crepuscular disorder	+7.81	-0.77	
nystagmus	+7.81	-0.77	
autoaggression	-2.65	+2.22	
ambivalency	-2.45	+2.35	
agression	+5.92	-0.94	
retrograde amnesia	-1.68	+1.70	
passive submission	+0.63	-0.23	

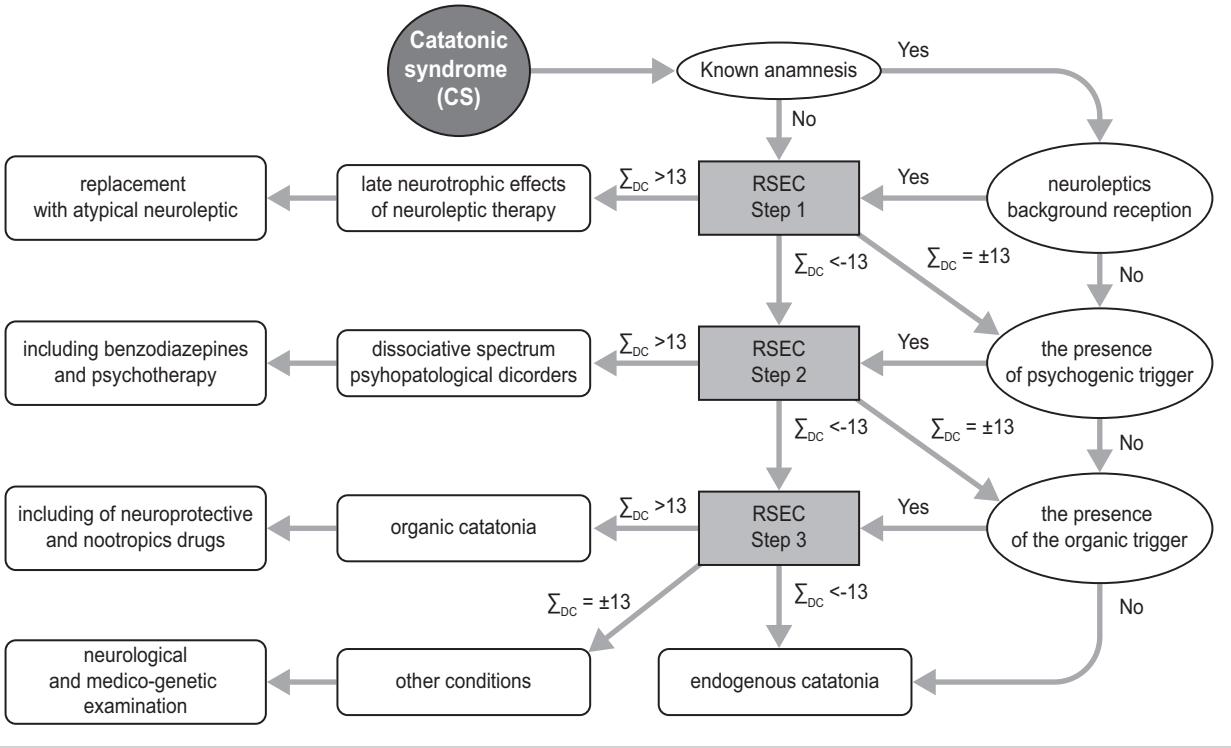

Fig. 1. Protocol of differential diagnostic of EC based on ECDS, steps 1–3.

conclusion of belonging psychopathological disorders to LNENT, CDD and OrCD (if $\sum_{DC}$ = +13), or to primary (endogenous) catatonia (if $\sum_{DC}$ = -13), which has confidence level = 95 % (p = 0.05). Reaching value of $\sum_{DC}$ = + 20 or -20 imposed a final diagnostic conclusion, which has confidence level = 99 % (p = 0.01). If higher confidence level is needed, process of phenomena education continues until reaching value $\sum_{DC}$ = +30 or -30 appropriate = 99.9 % (p = 0.001) confidence level.

There is a protocol of differential diagnostic of EC based on ECDS, steps 1–3 (*Fig. 1*).

The analysis of the developed protocol of differential diagnosis has been performed. Taking into account specificity of views on the discuss on the identification of psychomotorical and behavioral disorders of catatonic range double check in 2 vectors of the sensitivity and specificity of new diagnostics tool was made on anonymized and randomized contingent (sensitivity analysis) and on 30 patients of psychiatric hospital excepted catatonic semiotics (specificity analysis). These 2 vectors are:

1) formal competence (for clinical-statistical indicators of sensibility and specificity of ECDS protocol to diagnosis, obtained by verified diagnostic protocol – BFCRS): sensibility = 84.03 % (121 of 144 anonymized and randomized comparison group), specificity = 83.33 % (25 of 30 patients with excluded by dint of BFCRS catatonic symptoms);

2) discursively-native competence (for clinical-statistical indicators of sensibility and specificity of ECDS protocol to diagnosis, obtained by council of competent specialists: sensibility = 94.43 % (121 of 144 anonymized and randomized comparison group), specificity = 90.00 % (25 of 30 patients with excluded by dint of consensus catatonic symptoms).

Using of designed protocol allowed reaching the level of true positive results (sensibility) = 94.43 %, pseudo-negative = 5.56 %, true negative (specificity) = 90.00 %, pseudo-positive = 10.00 %.

Conclusions:

1. There differential diagnostic properties of clinical-psychopathological semiotics signs were revealed and analyzed in EC, LNENT, CDD and OrCD patients. Values of DC and IM were calculated. Reliability analysis of differences and IM values allowed separating valid signs for syndromic accessory of catatonia differential.

According to the methodology of diagnostic decision reliability for probability level attainment 95 % (p = 0.05), threshold $\sum_{DC}$ – is a constant = ±13, for reaching probability 99 % = ±20, for reaching probability 99.9 % = ±30:

– if $\sum_{DC}$ < -13, -20 and -30 psychopathological semiotic complex with probability 95%, 99% i 99,9% respectively, it speaks in favour to EC;

– if $\sum_{DC}$ < +13, +20 and +30 psychopathological semiotic complex with probability 95%, 99% i 99,9% respectively speaks in favour to CDD, OrCD and LNENT;

– in the range -13 < $\sum_{DC}$ < +13 – conclusion should not be considered reliable, because wherein p > 0.05.

2. All important signs were made into differential-diagnostic tables and posted in descending order of informativeness $\sum_{IM}$. All the valid and discursively-native marks were used in based on three-step realization algorithm ECDS protocol. Designed scale allows making a diag-

nostic decision of relatively psychopathological disorder to EC, LNENT, CDD or OrCD on any reliability level: 95 % (p = 0.05), 99 % (p = 0.01) or 99.9 % (p = 0.001). Based on the designed scale EC differential diagnostic protocol has been formed. Using of designed protocol allowed reaching the level of true positive results (sensibility) = 94.43 %, pseudo-negative = 5.56 %, true negative (specificity) = 90.00 %, pseudo-positive = 10.00 %.

Designed scales have a number of categorical differences from existing analogues, foremost by virtue of specificity of clinical-discursion compositions of using marks and disqualified conditions and excluding phenomena spectrum availability.

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Information about author:
Safonov D. N., Assistant of the Department of Psychiatry, Psychotherapy, General and Medical Psychology, Narcology and Sexology, Zaporizhzhia State Medical University, Ukraine.

Відомості про автора:
Сафонов Д. М., асистент каф. психіатрії, психотерапії, загальної та медичної психології, наркології та сексології, Запорізький державний медичній університет, Україна.

Сведения об авторе:
Сафонов Д. Н., ассистент каф. психиатрии, психотерапии, общей и медицинской психологии, наркологии и сексологии, Запорожский государственный медицинский университет, Украина.

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