

Psychological and Biological Markers of the Suicidal Behavior in Post-Partum Depressive Disorder

EDUARD NICUȘOR BONDOC¹, MARINESCU ILEANA²,
DRAGOȘ MARINESCU²

¹University of Medicine and Pharmacy of Craiova, Doctoral School

²University of Medicine and Pharmacy of Craiova

ABSTRACT: We performed a retrospective study on 30 subjects having subclinical depression in the past, involved in a psychotherapeutically process in the last 5 years, which gradually returned with a post-partum depressive episode. The subjects were between 20 and 38 years of age, without psychotic disorders, selected by psychological criteria. Our results showed that for patients' psychopathological profile we found depression, anxiety, affective instability of polymorph aspect, interpretative tendencies. These manifestations correlated significantly with profiles obtained from the Beck and Hamilton scales, often dominated by existential impasse with depressive and anxious tendencies. This study found many risk factors associated with suicidal behavior in patients with post-partum depressive disorder: age under 35, socio-familial and precarious economic status, childhood abuse, disharmonic family relationships, psychotrauma (abuse), emotional instability, accentuated personality, subclinical psychiatric suffering, a heredo-collateral history of mental illness, past history of suicide attempts, low cholesterol levels.

KEYWORDS: Cholesterol, suicidal behavior, depression

Introduction

In the context of the extensive and, at the same time, extremely serious problematic of the patient with post-partum suicidal behavior personality, question arises whether we can highlight markers of this trend.

We proceed from the assumption that post-partum depression, almost constantly associated with anxiety behavior, was the most common cause of suicide attempts.

The presence in the personality structure of the impulsive-explosive manifestations, the frequent depressive decompensation and the low level of family and matrimonial adaptation, facilitate the risk of suicide [1].

In order to avoid the suicidal behavior it was of great importance to early detect the pre-suicidal syndrome, the suicide's risk factors as well as the appropriate psychotherapeutic approach until the psychiatric consultation and the transfer to a specialized unit in case of repeated decompensation with repeated attempts [2].

Material and Methods

Aiming to highlight a complex psychological picture, underlined by the detection of bio-psychosocial determinants, we conducted a retrospective study on a group of 30 female subjects with a history of subclinical depression, addressing to psychotherapy in the last 5 years, between 2012 and 2017, which gradually returned with a post-partum depressive episode.

All subjects included in the study had to fill in an informed consent, prior to the onset of therapy, in accordance with current legislation, including the acceptance of results publication. In the composition of the group, the subjects are between 20 and 38 years of age, who at psychological exams did not show obvious psychotic disorders, the selection being made from a larger group of patients, tested by several methods.

From the point of view of biochemical vulnerability, cholesterol levels have been monitored in all cases (about 30 days before starting the psychotherapy and then every 90 days, for the whole period), whose downward trend, in correlation with psychosocial risk factors and heredo-collateral history may be a valuable predictor of suicide at patients who experienced a depressive non-psychotic sub-syndrome episode in the first three months post-partum [3].

Methods used in the study: observation, semi-directed interview, assessment scales, psychological tests:

Schmiescheck accentuated tendency Questionnaire aims to highlight aspects which lead to the diagnosis of personality structures, which is exacerbated subsumed clinical personality typology developed by K. Leonhard.

The subject answer yes or no key in there with most items. In descending order the interpretation indicate severity trend for the 18 and the 12 indicators, according to the author, limit that can diagnose a trend toward emphasis

in behaviour. The instrument consists of 88 questions, and has not any restriction on working time [4].

The **Hamilton Anxiety Rating Scale (HAM-A)** was originally published by Max Hamilton in 1959. It is a psychological questionnaire used by clinicians to rate the severity of a patient's anxiety. Anxiety can refer to things such as a mental state, a drive, a response to a particular situation, a personality trait and a psychiatric disorder. The scale consists of 14 items designed to assess the severity of a patient's anxiety. Each of the 14 items contains a number of symptoms, and each group of symptoms is rated on a scale of zero to four, with four being the most severe [5].

The **Beck Depression Inventory (BDI, BDI-1A, BDI-II)**, created by Aaron T. Beck, is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. Its development marked a shift among mental health professionals, who had until then, viewed depression from a psychodynamic perspective, instead of it being rooted in the patient's own thoughts [6].

Statistical analysis was performed using Microsoft Excel (Microsoft Corp., Redmond, WA, USA), together with the XLSTAT add-on for MS Excel (Addinsoft SARL, Paris, France) and IBM SPSS Statistics 20.0 (IBM Corporation, Armonk, NY, USA) for processing the data.

Data was recorded using Microsoft Excel files, then it was statistically analyzed to find relationship between the study variables. Statistical tests (Pearson's r correlation coefficient and Chi Square test) were performed using the XLSTAT add-on or SPSS.

The Chi square test (χ^2) is a statistical test that shows if there is a connection (association or influence) between two factors. It is used to interpret incidence tables generated by cross tabulation of 2 factors monitored in the study.

"Correlation" is a general term used to define the interdependence or relationship between variables observed in statistical population.

In a narrow sense, however, it represents a measure of the statistical relationship between quantitative variables, as defined by a "correlation coefficient".

The most commonly used is the Pearson's "r" correlation coefficient (or linear correlation coefficient), which measures the degree of relationship between two variables.

Because our data did not have a Gaussian distribution, but can be ordered, we used Spearman "ρ" (rho) coefficient obtained by Spearman nonparametric test for rank correlation.

We used both Chi square test and Spearman's rho to find the factors that have significant relationships between them.

Results

In the psychopathological profile of these patients prevailed depression, anxiety, affective instability of polymorph aspect, interpretative tendencies.

These manifestations correlate significantly with profiles obtained from the Beck and Hamilton scales, often dominated by existential impasse with depressive and anxious tendencies observed with Schmiescheck accentuated tendency Questionnaire.

The results of the examinations made with these scales are presented in Table 1 and the graphical representation is shown in Fig.1.

Table 1. Number of people tested with the Hamilton Scale and levels of anxiety

Sex	Level of anxiety				
	0- absent	1- low	2- moderate	3- severe	4- serious /very serious
Feminine	3	4	7	10	6

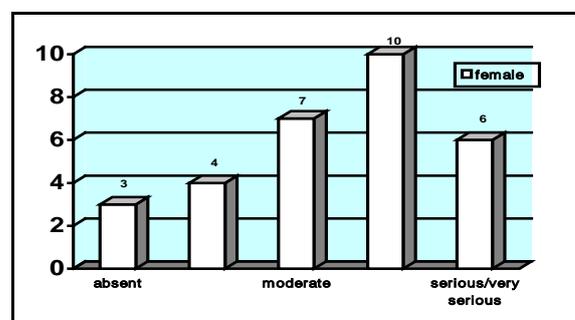


Fig.1. Results for the Hamilton Scale-evel of anxiety

Regarding the depression level of the group, the measurement was done using the Beck scale; the results are presented in Table 2, and the graphical presentation is shown in Fig.2

Table 2. Number of persons tested with Beck Scale and levels of depression

Sex	Level of depression				
	<0,5- absent	0,5- 1.2- low	1,2-2- severe	2-2,5- serious	>2,5- extreme
Feminine	3	6	11	10	0

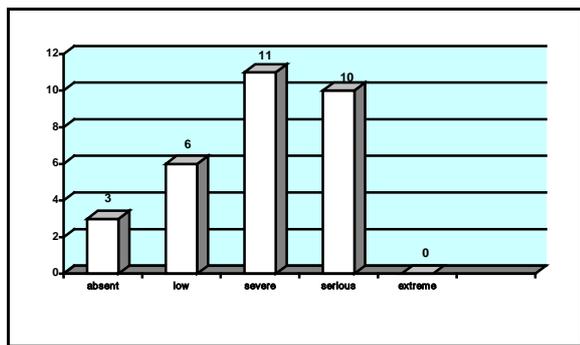


Fig.2. Results for the Beck Scale Level of depression

People in the study group had common elements of adaptation and behavior:

- had a significantly reduced percentage of questions concerning family, marital and professional adjustment;
 - intra-family conflicts;
 - low activism;
 - emotional instability;
 - low professional performance.

The interpretation of the Psychorater personality questionnaire results revealed that out of the total of 30 people:

- 90% falls into the "F" category (fragile/vulnerable);

- 10% in the "P" category (personality disorders-a psychiatric consultation is reasonable);

The absolute values obtained can be found in Table 3 and the graphic illustration can be seen in Figure 3.

Table 3. Types of personalities for the present study group

Category	„F” - fragile	„P”- personality disorder
Total	27	3

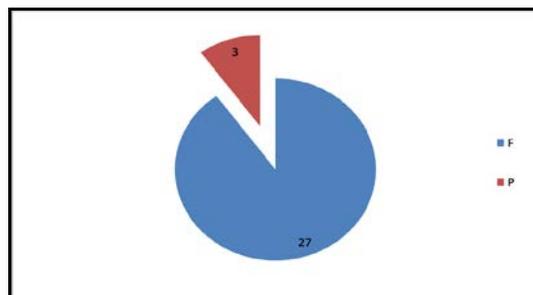


Fig.3. Types of personalities for the study group (F-fragile; P-personality disorder)

In Fig.4 we included all psychological and psychiatric elements revealed through tests or interviews.

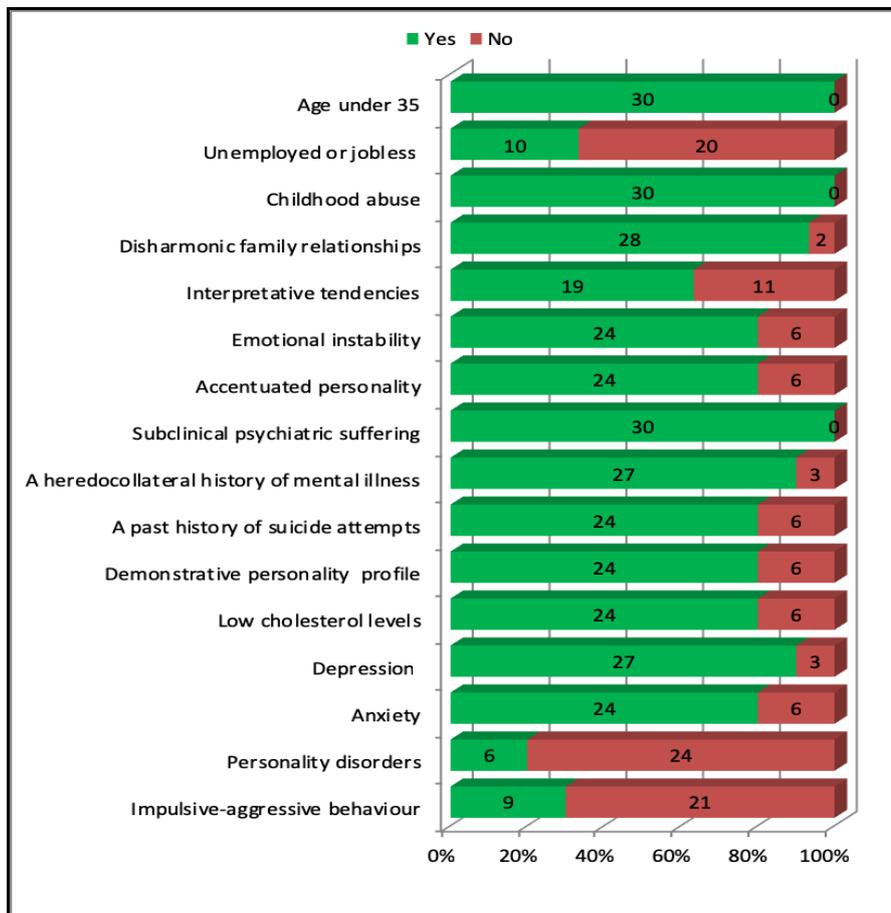


Fig.4. Descriptive analysis of the study group

All patients had: age under 35, childhood abuse and subclinical psychiatric suffering, so no correlations could be computed for them.

All correlations between the analyzed factors are presented in Table 4.

Values in bold show a correlation between the factors with a significance $p < 0.05$; green cells show direct correlation; red cells show inverse correlation.

Table 4. Spearman's rho correlation coefficients between the factors analyzed in the study

Variables	Unemployed or jobless	Disharmonic family relationships	Interpretative tendencies	Emotional instability	Accentuated personality	A heredo collateral history of mental illness	A past history of suicide attempts	Demonstrative personality profile	Low cholesterol levels	Depression	Anxiety	Personality disorders	Impulsive-aggressive behaviour
Unemployed or jobless		0.189	-0.196	-0.177	-0.177	0.236	0.000	0.000	0.000	-0.236	-0.177	0.530	0.463
Disharmonic family relationships	0.189		0.074	-0.134	-0.134	0.356	0.200	0.200	0.200	0.356	0.200	0.134	0.175
Interpretative tendencies	-0.196	0.074		-0.380	-0.380	-0.023	-0.208	-0.208	-0.208	-0.023	-0.035	-0.138	-0.106
Emotional instability	-0.177	-0.134	-0.380		1.000	0.111	0.167	0.167	0.167	-0.167	0.167	0.042	0.145
Accentuated personality	-0.177	-0.134	-0.380	1.000		0.111	0.167	0.167	0.167	-0.167	0.167	0.042	0.145
A heredo collateral history of mental illness	0.236	0.356	-0.023	0.111	0.111		-0.167	-0.167	-0.167	0.259	-0.167	0.167	0.218
A past history of suicide attempts	0.000	0.200	-0.208	0.167	0.167	-0.167		1.000	1.000	-0.167	0.375	0.250	0.327
Demonstrative personality profile	0.000	0.200	-0.208	0.167	0.167	-0.167	1.000		1.000	-0.167	0.375	0.250	0.327
Low cholesterol levels	0.000	0.200	-0.208	0.167	0.167	-0.167	1.000	1.000		-0.167	0.375	0.250	0.327
Depression	-0.236	0.356	-0.023	-0.167	-0.167	0.259	-0.167	-0.167	-0.167		-0.167	-0.111	-0.024
Anxiety	-0.177	0.200	-0.035	0.167	0.167	-0.167	0.375	0.375	0.375	-0.167		0.042	-0.218
Personality disorders	0.530	0.134	-0.138	0.042	0.042	0.167	0.250	0.250	0.250	-0.111	0.042		0.764
Impulsive-aggressive behaviour	0.463	0.175	-0.106	0.145	0.145	0.218	0.327	0.327	0.327	-0.024	-0.218	0.764	

For the pairs of factors that proved to be correlated with statistical significance via Spearman's coefficient of correlation, we also performed a Chi square test, to have a confirmation of the observed relationships.

Table 5. Relationship between personality disorders and unemployed or jobless status

Unemployed or jobless/Personality disorders	Yes	No	Total
Yes	5 (50.00%)	5 (50.00%)	10 (100.00%)
No	1 (5.00%)	19 (95.00%)	20 (100.00%)
Total	6 (20.00%)	24 (80.00%)	30 (100.00%)
p Chi square	0.004		S

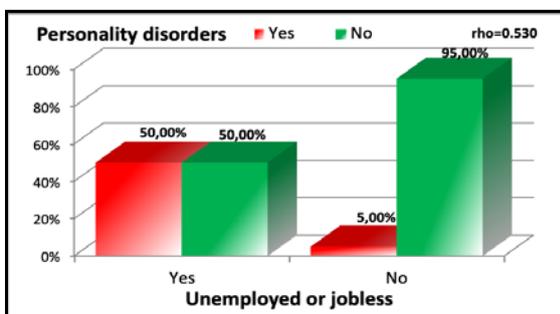


Fig.5. Relationship between personality disorders and unemployed or jobless status

There is a significant relationship between personality disorders and unemployed or jobless status, with a Chi square significance $p = 0.004 < 0.05$, which further proves the strong correlation identified by Spearman's rho value, $\rho = 0.530$.

Table 6. Relationship between impulsive-aggressive behaviour and unemployed or jobless status

Unemployed or jobless/Impulsive-aggressive behaviour	Yes	No	Total
Yes	6 (60.00%)	4 (40.00%)	10 (100.00%)
No	3 (15.00%)	17 (85.00%)	20 (100.00%)
Total	9 (30.00%)	21 (70.00%)	30 (100.00%)
p Chi square	0.011		S

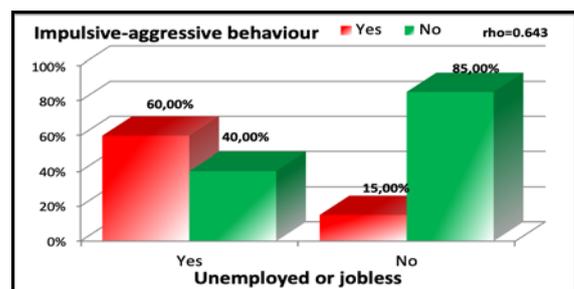


Fig.6. Relationship between impulsive-aggressive behaviour and unemployed or jobless status

There is a significant relationship between impulsive-aggressive behaviour and unemployed or jobless status, with a Chi square significance $p=0.011<0.05$, which further proves the strong correlation identified by Spearman's rho value, $\rho=0.643$.

Table 7. Relationship between impulsive-aggressive behaviour and personality disorders

Personality disorders\Impulsive-aggressive behaviour	Yes	No	Total
Yes	6 (100.00%)	0 (0.00%)	6 (100.00%)
No	3 (12.50%)	21 (87.50%)	24 (100.00%)
Total	9 (30.00%)	21 (70.00%)	30 (100.00%)
p Chi square	0.000		HS

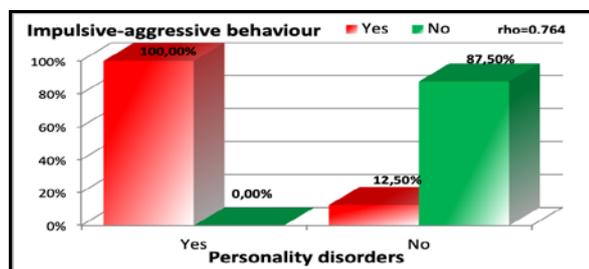


Fig.7. Relationship between impulsive-aggressive behaviour and personality disorders

There is a highly significant relationship between impulsive-aggressive behaviour and personality disorders status, with a Chi square significance $p<0.001$, which further proves the strong correlation identified by Spearman's rho value, $\rho=0.764$.

Table 8. Relationship between emotional instability and interpretative tendencies

Interpretative tendencies\Emotional instability	Yes	No	Total
Yes	13 (68.42%)	6 (31.58%)	19 (100.00%)
No	11 (100.00%)	0 (0.00%)	11 (100.00%)
Total	24 (80.00%)	6 (20.00%)	30 (100.00%)
p Chi square	0.037		S

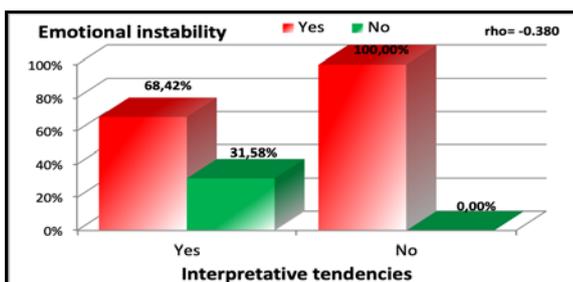


Fig.8. Relationship between emotional instability and interpretative tendencies

We found a significant relationship between emotional instability and interpretative tendencies, with a Chi square significance $p=0.037<0.05$, which further proves the notable inverse correlation identified by Spearman's rho value, $\rho=-0.380$

Table 9. Relationship between accentuated personality and interpretative tendencies

Interpretative tendencies\Accentuated personality	Yes	No	Total
Yes	13 (68.42%)	6 (31.58%)	19 (100.00%)
No	11 (100.00%)	0 (0.00%)	11 (100.00%)
Total	24 (80.00%)	6 (20.00%)	30 (100.00%)
p Chi square	0.037		S

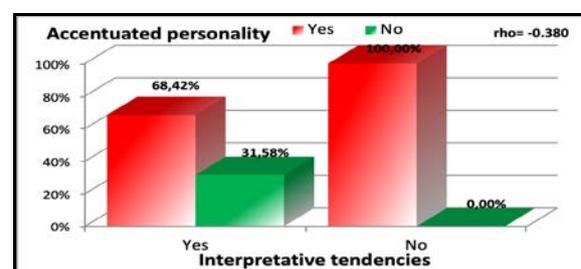


Fig.9. Relationship between accentuated personality and interpretative tendencies

We found a significant relationship between accentuated personality and interpretative tendencies, with a Chi square significance $p=0.037<0.05$, which further proves the notable inverse correlation identified by Spearman's rho value, $\rho=-0.380$.

Table 10. Relationship between accentuated personality and emotional instability

Emotional instability\Accentuated personality	Yes	No	Total
Yes	24 (100.00%)	0 (0.00%)	24 (100.00%)
No	0 (0.00%)	6 (100.00%)	6 (100.00%)
Total	24 (80.00%)	6 (20.00%)	30 (100.00%)
p Chi square	4.32 x 10 ⁻⁸		HS

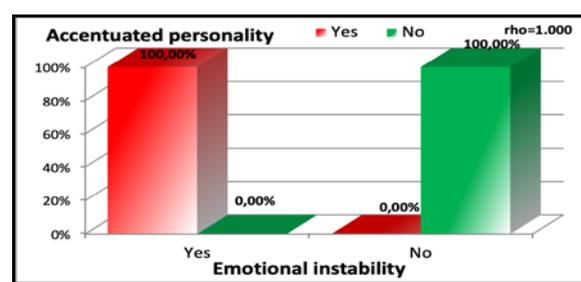


Fig.10. Relationship between accentuated personality and emotional instability

There is a highly significant relationship between accentuated personality and emotional instability, with a Chi square signifiacne $p < 0.001$, which further proves the perfect correlation identified by Spearman's rho value, $\rho = 1.000$.

Table 11. Relationship between anxiety and suicide attempts

Anxiety\Suicide attempts	Yes	No	Total
Yes	21 (87.50%)	3 (12.50%)	24 (100.00%)
No	3 (50.00%)	3 (50.00%)	6 (100.00%)
Total	24 (80.00%)	6 (20.00%)	30 (100.00%)
p Chi square		0.040	S

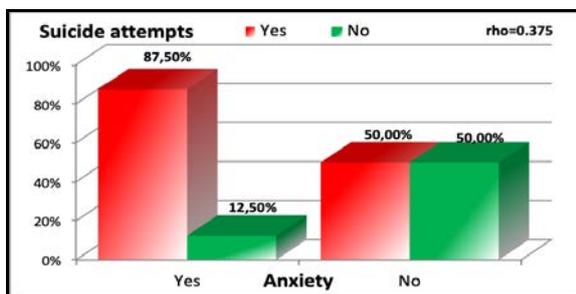


Fig.11. Relationship between anxiety and suicide attempts

We found a significant relationship between anxiety and suicide attempts, with a Chi square signifiacne $p = 0.040 < 0.05$, which further proves the notable direct correlation identified by Spearman's rho value, $\rho = 0.375$.

Table 12. Relationship between anxiety and demonstrative personality profile

Anxiety\Demonstrative personality profile	Yes	No	Total
Yes	21 (87.50%)	3 (12.50%)	24 (100.00%)
No	3 (50.00%)	3 (50.00%)	6 (100.00%)
Total	24 (80.00%)	6 (20.00%)	30 (100.00%)
p Chi square		0.040	S

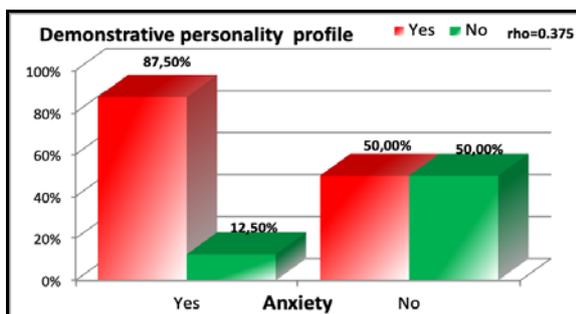


Fig.12. Relationship between anxiety and demonstrative personality profile

We found a significant relationship between anxiety and demonstrative personality profile, with a Chi square signifiacne $p = 0.040 < 0.05$, which further proves the notable direct correlation identified by Spearman's rho value, $\rho = 0.375$.

Table 13. Relationship between suicide attempts and demonstrative personality profile

Demonstrative personality profile\ Suicide attempts	Yes	No	Total
Yes	24		24
No		6	6
Total	24	6	30
p Chi square		4.32×10^{-8}	HS

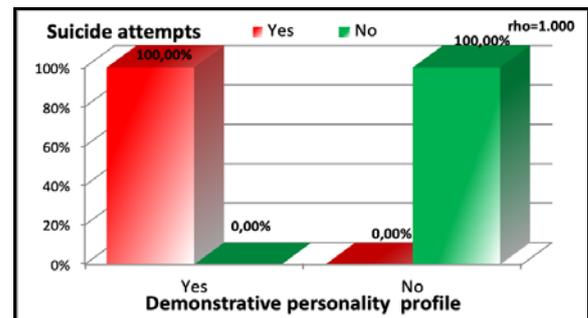


Fig.13. Relationship between suicide attempts and demonstrative personality profile

There is a highly significant relationship between suicide attempts and demonstrative personality profile, with a Chi square signifiacne $p < 0.001$, which further proves the perfect correlation identified by Spearman's rho value, $\rho = 1.000$.

Table 14. Relationship between suicide attempts and low cholesterol levels

Low cholesterol levels\Suicide attempts	Yes	No	Total
Yes	24	0	24
No	0	6	6
Total	24	6	30
p Chi square		4.32×10^{-8}	HS

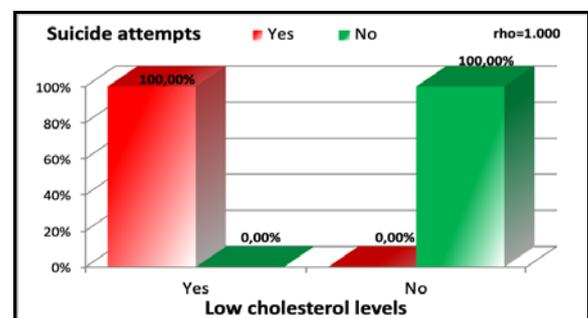


Fig.14. Relationship between suicide attempts and low cholesterol levels

There is a highly significant relationship between suicide attempts and low cholesterol levels, with a Chi square signifiante $p < 0.001$, which further proves the perfect correlation identified by Spearman's rho value, $\rho = 1.000$.

Table 15. Relationship between demonstrative personality profile and low cholesterol levels

Low cholesterol levels\Demonstrative personality profile	Yes	No	Total
Yes	24	0	24
No	0	6	6
Total	24	6	30
p Chi square	4.32 x10 ⁻⁸		HS

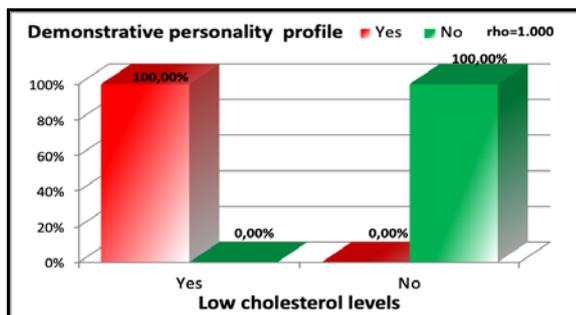


Fig.15. Relationship between demonstrative personality profile and low cholesterol levels

There is a highly significant relationship between demonstrative personality profile and low cholesterol levels, with a Chi square signifiante $p < 0.001$, which further proves the perfect correlation identified by Spearman's rho value, $\rho = 1.000$.

Discussions

The results outlined some risk factors for suicidal behavior in patients with post-partum depressive disorder: age under 35, socio-familial and precarious economic status, childhood abuse, disharmonic family relationships, psychic trauma (abuse), emotional instability, accentuated personality, subclinical psychiatric suffering, a family history of mental illness, a past history of suicide attempts, low cholesterol levels.

A careful analysis following the application of the Schmiescheck questionnaire revealed significant percentages in dysthymic structures (70%) and moderate to demonstrative (30%) who, due to existential matrimonial impasse, exhibit hysterical tendencies, disproportionate and driven behavior towards obtaining material or moral benefits ("if not ... I will kill myself").

On dysthymic personality structures, the characteristics that favor suicidal tendencies (hyper excitability, hyper-persistence,

impulsivity) were correlated with low cholesterol levels (less than 160mg/l) seen in 80% of the subjects in the group.

In the studied group, the emotional imbalance that may have as a determining factor an abuse, psychic trauma or even compulsive alcohol or psychotropic consumption, favored existential impasse and these, under certain conditions-dependng on the intensity of the stressful state, can favor a suicidal behavior.

By applying the Psychorater test [7], we found out that of the total of 30 subjects, 27 were in the "fragile" category and 3 had personality disorders. This test also reveals that childhood abuses, disharmonic family relationships, and psycho-traumatic situations played an important role in the development of impulsive-aggressive behaviors, which are often associated with autolytic attempts.

We also noticed after the application of the Schmiescheck accentuated tendency Questionnaire, a significant percentage for dysthymic and demonstrative structures. Significant personality features that favored suicidal tendencies were found in 80% of the subjects of the lot, consisting of: hyper excitability, hyper-perceptivity, impulsivity, the rest of 20%, had elements of demonstrative (histrionic) accentuated personality.

The distribution of cases by employment status reveals a high percentage of the suicide attempt in the unemployed or jobless (33.3%), which led us to conclude that the loss or diminution of the socio-professional insertion was another factor favoring the autolytic behavior, in correlations with other author's results [8].

All of these findings confirmed the assumptions that suicide attempts occurs in the context of a background of a raised individual vulnerability at all levels (bio-genetic, bio-chemical, cognitive and social), to which a number of contextual factors can be added [9].

In such situations was recommended to strengthen the psycho-prophylactic methods in order to detect such persons and the establishment of appropriate psycho-prophylactic measures.

Nevertheless, it is already found that impulsive behavior correlated significantly with low cholesterol levels (below 160mg/l), determined in the first week following a suicidal attempt, in all patients who did not qualify for a demonstrative personality profile. Sullivan et al (1994) investigated depressive patients and found that those with high suicidality had

significantly lower cholesterol concentrations, compared with those with low suicidality [10].

Modai et al (1994) examined 584 psychiatric inpatients and showed that patients with a history of attempted suicide had significantly lower serum cholesterol than non-suicidal patients [11].

This raised the possibility that the postulated association between low serum cholesterol and suicidal behavior could have relevance to biological mechanisms operating in depression.

Suicide's significant correlation with depression, even post-partum depression was connected with the cognitive process of rumination.

Smith, Alloy and Abramson have shown that a rumination cognitive style could predict hopelessness and suicide ideation. Other research conducted in this field has shown that rumination may be described and even prolonged by cognitive rigidity [12].

Conclusions

From the applied tests (Hamilton for anxiety, Beck for depression), it emerged that out of the total studied cases (N=30), 27 subjects had anxiety in varying degrees. Taking into account the high percentage of subjects with anxiety and depression, we concluded that suicidal attempts are often accompanied and could be potentiated by these symptoms.

It is thus considered that subclinical post-partum depression is in itself a risk factor for suicidal behavior, and psychological evaluation becomes mandatory for prevention.

Regarding to suicide prevention, it was particularly important to have a correct diagnosis and to identify suicidal risk, which was very high in depressive decompensation.

Another key element in psycho-prophylaxis was the setting up of therapies for diminishing impulsive tendencies and improving interpersonal and social support in parallel with the removal of favorable suicidal factors.

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Corresponding Author: Marinescu Ileana, Department, University of Medicine and Pharmacy of Craiova, Aleea 1 Potelu, nr.24, Psychiatry Clinic no.1, e-mail: marinescu_psy@yahoo.com