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HOSTILITY AND ANGER IN PATIENTS DEPENDENT ON DIFFERENT PSYCHOACTIVE DRUGS

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Abstract

We assessed 311 participants with dependence on opioids, stimulants, alcohol, polysubstance dependence, and a control group with no dependence using clinical structured interview, Buss-Durkee Hostility Inventory, and State-Trait Anger Expression Inventory (STAXI). Our study results demonstrated that in all groups of dependent participants anger, verbal, physical and indirect aggression are significantly higher than in control group. We found that severity and forms of aggressive behaviour in dependent patients are correlated with the type of substance abused; aggressive behaviour appeared to be correlated with the characteristics of anger. Higher level of aggressiveness, anger and irritation were in groups of polysubstance and stimulant abusers. We also found specific predictors of anger and aggression for groups of subjects dependent on different drugs.

Key words: *Psychoactive substances; Drug dependence; Alcohol dependence; Affective disorders; Aggression; Anger*

1. INTRODUCTION

Aggressive behaviour is a complex biopsychosocial problem that is studied by researchers in various fields of psychology, psychiatry, addiction research, sociology, criminology, philosophy, and others. Aggression plays a significant role in the structure of addictive disorders and contributes to family and interpersonal conflict (Neznanov, 1994; Rean, 1996; Miczek, DeBold, & Haney, 1994; Schuckit, 2000; Martin-Storey, Serbin, & Stack, 2011; Nurco, Shaffer, & Ball, 1984).

Aggressive behaviour in drug users is caused by array of factors, such as toxic effects of drugs on the central nervous system, pathological changes in the brain, mental and behavioural disorders, as well as changes to the hierarchy of values of the individual (Beck & Freeman, 2002; WHO, 2004).

Aggression levels are correlated with hormonal, gender, and genetic individual characteristics hence biological factors are not the only definitive factors. Frequency and severity of aggressive response are determined by social and psychological factors. Emotion of anger plays a crucial role in the aggressive behaviour.

Anger is defined as an emotional state with various intensity, duration, and frequency that may cause cognitive changes and certain forms of physical reaction. Anger can be

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expressed out and can be controlled by internal mechanisms. Anger expression out is aggressive and usually followed by verbal and/or motor activity (Kassinov, 2006).

Properties of aggression, its severity and relations with the anger in subjects with various forms of dependence have not yet been sufficiently studied.

Aims of the study— To study indicators of aggression and anger and their relations to various forms of addiction.

2. METHODS

We assessed 311 participants divided into 5 groups: 91 subjects diagnosed with opioid dependence, 42 with stimulant dependence, 50 with polysubstance dependence (46 of them combined stimulants, opioids, and alcohol; four used cannabis, opioids, and alcohol), 38 with alcohol dependence; the control group comprised of 90 subjects with no diagnosed dependence.

Inclusion criteria: Clinically based diagnoses of opioid dependence, stimulant dependence, polysubstance dependence, or alcohol dependence; the substance is last used from 7 to 21 days before inclusion in the study; older than 18 years of age.

Exclusion criteria: did not sign the informed consent; subjects with schizophrenia, bipolar disorders, and epilepsy, severe neurological disorder or severe somatic disorder.

Research tools: we used clinical questionnaire to assess basic social and demographic characteristics, addictive and psychopathological status of subjects; Buss-Durkee Hostility Inventory (Buss & Durkee, 1957), and State-Trait Anger Expression Inventory (STAXI) (Spielberger, 1988).

Data analysis. Contingency tables and Fisher's exact test were used; correlations between indicators were analyzed using Spearman rank correlation coefficient. Differences between groups were analyzed using non-parametric methods including Kruskal-Wallis one-way analysis of variance and Wilcoxon rank-sum tests. Predictors of aggression and anger within groups were identified using regression analysis (results of STAXI and Buss-Durkee scales were used as dependent variables and social and clinical data was used as independent variables; for all results $p < 0,05$).

3. RESULTS

Social and demographic characteristics (table 1). Of 311 participants, 213 (68,48%) were men and 98 were women (31,51%). Opioid-dependent group was comprised of 59 (64,84%) men and 32 (35,16%) women; stimulant users group included 32 (76,19%) men and 10 (23,81%) women; polysubstance users group had 37 (74%) male and 13 (26%) female participants; alcohol-dependent group— 33 (86,84%) men and 5 (13,16%) women, and the control group – 54 (60,00%) и 36 (40,00%) respectively.

Mean age ($M \pm SE$) in the opioid group was $24,24 \pm 0,54$ years; stimulant – $21,74 \pm 0,79$, polysubstance– $26,84 \pm 0,75$, alcohol – $33,71 \pm 0,90$, and control group– $21,27 \pm 0,50$.

In the group of alcohol-dependent patients the mean age was significantly higher comparing to the other groups (table 1). Participants in stimulant and control groups were younger than in opioid and polysubstance groups ($p < 0,05$); opioid users were younger than polysubstance users ($p < 0,05$).

Clinical characteristics of participants. The clinical and psychological tests were administered $15,96 \pm 0,98$ days after last opioid use, – $14,88 \pm 0,69$ days after the last use of stimulants, – $14,26 \pm 0,42$ after last drink of alcohol, and $12,88 \pm 0,49$ days after polysubstance use. No statistically significant differences between groups were found for this indicator.

The earliest onset of drug addiction in our study was in the stimulant group – $18,62 \pm 0,52$ years old; opioid-dependent patients were somewhat older – $18,92 \pm 0,40$ years; polysubstance

users were – $20,90 \pm 0,64$ years of age; and, the oldest group was the group of drinkers with $33,71 \pm 0,90$ years.

Table 1. Social and demographic characteristics of study subjects

	Groups	OD n=91	SD n=42	PD n=50	AD n=38	CG n=90
Sex	Male	59 (64,84%)	32 (76,19%)	37 (74,00%)	33 (86,84%)	54 (60,00%)
	Female	32 (35,16%)	10 (23,81%)	13 (26,00%)	5 (13,16%)	36 (40,00%)
Education	University diploma	4 (4,40%)	1 (2,38%)	5 (10,00%)	16 (42,11%)	12 (13,33%)
	Some university-level education	15 (16,48%)	9 (21,43%)	9 (18,00%)	2 (5,26%)	26 (28,89%)
	High school	59 (64,84%)	26 (61,90%)	36 (72,00%)	19 (50,00%)	45 (50,00%)
	Middle school	13 (14,29%)	6 (14,29%)	0	1 (2,63%)	7 (7,78%)
Employment	Qualified labor	28 (30,77%)	10 (23,81%)	27 (54,00%)	31 (81,58%)	32 (35,56%)
	Student	16 (17,58%)	15 (35,71%)	6 (12,00%)	0	57 (63,33%)
	Unqualified labor	8 (8,79%)	3 (7,14%)	4 (8,00%)	2 (5,26%)	0
	Unemployed	39 (42,86%)	14 (33,33%)	13 (26,00%)	5 (13,16%)	1 (1,11%)
Satisfaction with current employment	Positive	36 (69,24%)	17 (60,72%)	20 (54,05%)	25 (75,76%)	74 (83,15%)
	Neutral	8 (15,38%)	3 (10,71%)	4 (10,81%)	2 (6,06%)	12 (13,48%)
	Negative	8 (15,38%)	8 (28,57%)	13 (35,14%)	6 (18,18%)	3 (3,37%)
Family status	Married	11 (12,09%)	5 (11,91%)	11 (22,00%)	18 (47,37%)	12 (13,33%)
	Common law partners	20 (21,98%)	3 (7,14%)	7 (14,00%)	7 (18,42%)	11 (12,22%)
	Divorced	7 (7,69%)	3 (7,14%)	5 (10,00%)	4 (10,53%)	0
	Widowed	1 (1,10%)	0	0	1 (2,63%)	0
	Single	52 (57,14%)	31 (73,81%)	27 (54,00%)	8 (21,05%)	67 (74,45%)
Need in family life	Positive	41 (45,06%)	23 (54,76%)	32 (64,00%)	27 (71,05%)	3 (4,33%)
	Neutral	33 (36,26%)	13 (30,95%)	13 (26,00%)	10 (26,32%)	48 (53,34%)
	Negative	16 (17,58%)	6 (14,29%)	5 (10,00%)	1 (2,63%)	29 (42,33%)

OD – opioid dependence, SD – stimulant dependence, PD – polysubstance dependence, AD – alcohol dependence, CG – control group.

The latest onset of addiction problems was in the alcohol group comparing with other groups ($p < 0,05$); polysubstance-dependent patients had the later addiction problem onset compared to stimulant-dependent patients ($p < 0,05$).

The shortest ($p < 0,05$) time since onset of the disease was in the stimulant group $37,14 \pm 5,07$ months; in the opioid group it was $63,64 \pm 4,26$ months; in polysubstant – $71,76 \pm 6,83$; and, the longest – in the alcohol group – $72,32 \pm 7,08$.

Compared to the other groups, stimulant-dependent patients had the shortest length of addiction problems.

Patients with opioid dependence had the most episodes of drug treatment in the past – $1,87 \pm 0,20$ times; alcohol-dependent patients had $1,79 \pm 0,32$ previous treatment attempts; polysubstance users – $1,42 \pm 0,28$; and, stimulant users – $0,29 \pm 0,08$. Opioid users had significantly higher number of treatment episodes compared with stimulant and polysubstance users ($p < 0,05$). Stimulant users had fewer treatment episodes than patients from all other groups ($p < 0,05$).

The longest remissions after the treatment episode were in alcohol-dependent group – $10,26 \pm 2,04$ months, opioid-dependent group – $8,00 \pm 0,92$, stimulant-dependent group – $0,64 \pm 0,32$. In the stimulant-dependent group remissions were the shortest compared with the other groups ($p < 0,05$).

36 (94,74%) of patients suffering from alcohol dependency, 47 (94%) polysubstance users, 38 (90,48%) stimulant users, and 30 (80,22%) opioid users reported further need for treatment and readiness for it.

Results of emotional disorders analysis are presented in table 2.

Table 2. Prevalence of emotional disorders in the study groups, %.

	OD	SD	PD	AD	CG
Dysthymia	23,08 ^{1,3}	2,38 ^{1,4}	12,00 ⁷	18,42 ^{6,4}	0 ^{3,6,7}
Mild depression	37,36 ^{1,2,3}	4,76 ^{1,4}	6,00 ^{2,5}	39,47 ^{4,5,6}	6,66 ^{3,6}
Moderate depression	13,18 ³	2,38	2,00	10,53 ⁶	0 ^{3,6}
Dysphoria	16,7 ^{1,2,3,9}	66,7 ^{1,4,8}	76,5 ^{2,5,7}	2,6 ^{4,5,9}	0 ^{3,7,8}
Hyperesthesia	16,48 ^{1,2}	61,90 ^{1,4,8}	76,00 ^{2,5,7}	23,68 ^{4,5,6}	2,22 ^{6,7,8}
Anxiety	39,56 ^{1,2,3}	16,66 ^{1,4,8}	20,00 ^{2,5,7}	52,63 ^{4,5,6}	3,33 ^{3,6,7,8}
Emotional lability	26,56 ^{1,2,3}	71,42 ^{1,4,8}	72,00 ^{2,5,7}	26,32 ^{4,5,6}	4,44 ^{3,6,7,8}
Irritability	16,48 ^{1,2,3}	69,04 ^{1,4,8}	64,00 ^{2,5,7}	31,58 ^{4,5,6}	1,11 ^{3,6,7,8}
Apathy	53,84 ^{1,2,3}	26,19 ^{1,4,8}	26,00 ^{2,5,7}	60,53 ^{4,5,6}	0 ^{3,6,7,8}
Explosiveness	39,56 ^{1,2,3}	71,43 ^{1,4,8}	70,00 ^{2,5,7}	47,37 ^{4,5,6}	0 ^{3,6,7,8}

Statistically significant differences between groups ($p < 0,05$) using Fisher's exact test: ¹ – OD and SD, ² – OD and PD, ³ – OD and CG, ⁴ – AD and SD, ⁵ – AD and PD, ⁶ – AD and CG, ⁷ – PD and CG, ⁸ – SD and CG, ⁹ – OD and AD.

Buss-Durkee Hostility Inventory results (table 3). Comparative analysis revealed that in the polysubstance dependence group levels of «physical», «indirect», and «verbal» aggression were the highest compared with all other groups ($p < 0,05$) excluding stimulant users.

«Indirect» and «verbal» aggression scores in the stimulant group were higher than in alcohol and control groups ($p < 0,05$).

Control group demonstrated the lowest scores on «resentment» scale ($p < 0,05$). Polysubstance users demonstrated the highest «resentment» compared to all other groups ($p < 0,05$).

The highest levels of «suspicion» were found in the stimulant users; it was significantly higher than the control group.

Lower results on «guilt» score were demonstrated by the control group compared to alcohol, polysubstance, and stimulant groups ($p < 0,05$); polysubstance and stimulant users showed higher «guilt» level than opioid users ($p < 0,05$).

«Aggression index» in the polysubstance group was higher than in opioid, alcohol, and control groups ($p < 0,05$).

«Hostility and aggression index» were significantly lower in the control group compared to all other groups.

Table 3. Buss-Durkee Hostility Inventory results

	OD, M±SE	SD, M±SE	PD, M±SE	AD, M±SE	CG, M±SE
«Physical aggression» (assault)	63,23 ± 2,82 ¹	67,94 ± 4,32	80,55 ± 3,55 ^{1,3,4}	62,33 ± 4,58 ³	58,42 ± 2,20 ⁴
«Indirect aggression» (indirect hostility)	72,11 ± 2,52 ¹	79,53 ± 4,24 ^{6,7}	87,23 ± 3,26 ^{1,3,4}	62,24 ± 3,78 ^{3,7}	65,00 ± 2,25 ^{4,6}
«Verbal aggression»	65,25 ± 2,54 ¹	70,35 ± 3,27 ^{6,7}	74,58 ± 3,64 ^{1,3,4}	55,03 ± 3,30 ^{3,7}	54,82 ± 2,04 ^{4,6}
«Irritation»	52,88 ± 2,28	59,56 ± 3,11	60,97 ± 2,85	55,09 ± 2,79	50,00 ± 2,07
«Negativism»	61,25 ± 2,78	62,94 ± 3,69	58,06 ± 4,39	46,06 ± 3,84	56,89 ± 2,64
«Resentment»	67,84 ± 2,60 ^{1,5}	67,29 ± 4,09 ^{2,6}	81,35 ± 2,25 ^{1,2,3,4}	74,45 ± 3,16 ^{3,10}	50,12 ± 2,09 ^{4,5,6,10}
«Suspicion»	52,25 ± 2,26	63,74 ± 3,82 ⁶	55,71 ± 3,14	48,67 ± 4,31	47,42 ± 2,18 ⁶
«Guilt»	65,31 ± 2,42 ^{1,9}	78,94 ± 2,99 ^{6,9}	79,84 ± 3,10 ^{1,4}	77,00 ± 3,25 ¹⁰	55,24 ± 2,55 ^{4,6,10}
«Aggression index»	68,86 ± 2,63 ^{1,5}	72,61 ± 3,94 ⁶	80,79 ± 3,48 ^{1,3,4}	67,87 ± 3,89 ^{3,10}	59,41 ± 2,16 ^{4,5,6,10}
«Hostility index»	60,05 ± 2,43 ⁵	65,52 ± 3,96 ⁶	68,53 ± 2,70 ⁴	61,56 ± 3,74 ¹⁰	48,77 ± 2,14 ^{4,5,6,10}

Statistically significant differences between groups ($p < 0,05$) using Mann–Whitney U test : 1 – PD and OD, 2 – PD and SD, 3 – PD and AD, 4 – PD and CG, 5 – OD and CG, 6 – SD and CG, 7 – SD and AD, 8 – OD and AD, 9 – SD and OD, 10 – AD and CG.

Table 4. State-Trait Anger Expression Inventory (STAXI) results

	OD, M±SE	SD, M±SE	PD, M±SE	AD, M±SE	CG, M±SE
«Feeling angry»	10,80 ± 0,24	11,46 ± 0,43	11,48 ± 0,54	10,88 ± 0,21	12,72 ± 0,59
«Trait anger»	19,80 ± 0,74 ^{1,5}	22,17 ± 1,20 ⁴	23,23 ± 0,91 ^{1,2,3}	20,21 ± 0,76 ^{2,6}	17,86 ± 0,61 ^{3,4,5,6}
«Angry temperament»	8,20 ± 0,35	8,23 ± 0,48	8,94 ± 0,45	7,45 ± 0,44	8,69 ± 0,37
«Angry reaction»	9,78 ± 0,32 ¹	9,74 ± 0,52 ⁷	11,77 ± 0,55 ^{1,2,3,7}	10,00 ± 0,45 ²	9,10 ± 0,30 ³
«Anger expression-in»	15,88 ± 0,44 ^{1,9}	15,20 ± 0,75 ^{7,8}	18,10 ± 0,70 ^{1,3,7}	19,27 ± 0,65 ^{6,8,9}	14,87 ± 0,48 ^{3,6}
«Anger expression-out»	17,05 ± 0,56 ⁵	17,86 ± 0,78 ⁴	18,58 ± 0,72 ^{2,3}	15,27 ± 0,56 ²	14,91 ± 0,38 ^{3,4,5}
«Anger control»	20,02 ± 0,56	19,91 ± 0,83	19,55 ± 0,64	22,21 ± 0,79	21,16 ± 0,55

Statistically significant differences between groups ($p < 0,05$) using Mann–Whitney U test: 1 – PD and OD, 2 – PD and AD, 3 – PD and CG, 4 – SD and CG, 5 – OD and CG, 6 – AD and CG, 7 – SD and PD, 8 – SD and AD, 9 – AD and OD.

State-Trait Anger Expression Inventory (STAXI) results (table 4). Results of the STAXI revealed that control group participants demonstrated lower levels of «trait anger» than any of the dependent groups ($p < 0,05$). Polysubstance group showed the significantly higher levels on this scale ($p < 0,05$) compared to all other groups excluding stimulant users.

Table 5. Statistically significant correlations between clinical and psychological indicators (using Spearman rank correlation coefficient).

Opioid addiction $p < 0,05$	Age	«Anger expression-out» (–0,27), «Indirect aggression» (–0,19)
	Length of remissions	«Trait anger» (–0,23), «Verbal aggression» (–0,20)
	«Physical aggression»	«Feeling angry» (0,35), «Trait anger» (0,24), «Anger expression-out» (0,37), «Anger control» (–0,34)
	«Verbal aggression»	«Trait anger» (0,43), «Anger expression-out» (0,26)
	«Indirect aggression»	«Trait anger» (0,26), «Angry temperament» (0,24), «Anger control» (–0,24), «Anger expression-out» (0,34)
	«Aggression index»	«Trait anger» (0,38), «Anger temperament» (0,22), «Feeling angry» (0,30), «Anger expression-out» (0,40), «Anger control» (–0,30), Anxiety (–0,23), mild depression (–0,26)
Alcohol addiction $p \leq 0,05$	Age of first use	«Anger expression-out» (0,30)
	Number of treatment episodes	«Feeling angry» (0,30)
	«Physical aggression»	«Feeling angry» (0,36), «Anger control» (–0,30)
	«Verbal aggression»	Length of drug use (0,27), multiple treatment attempts in the past (0,31), «Angry reaction» (0,27), «Anger expression-out» (0,39), «Anger control» (–0,33), anxiety (–0,25)
	«Indirect aggression»	Age (–0,34), length of drug use (–0,37), «Angry temperament» (0,28), «Anger expression-out» (0,30), dysthymia (–0,24)
	«Aggression index»	«Feeling angry» (0,35), «Angry reaction» (0,30), «Anger expression-out» (0,38), «Anger control» (–0,30), dysthymia (–0,31)
Polysubstant addiction $p < 0,05$	Age	«Verbal aggression» (–0,32)
	Family conflict because of drug use	Length of previous remissions (0,31)
	«Physical aggression»	«Trait anger» (0,44), «Angry temperament» (0,43), «Angry reaction» (0,35), «Anger expression-out» (0,29), «Feeling angry» (0,36)
	«Verbal aggression»	Length of drug use (–0,27), «Trait anger» (0,66), «Angry temperament» (0,37), «Feeling angry» (0,35), «Angry reaction» (0,39), «Anger expression-out» (0,39), dysphoria (0,31)
	«Indirect aggression»	«Trait anger» (0,38), «Angry temperament» (0,39), «Angry reaction» (0,33), «Anger expression-out» (0,30)
	«Aggression index»	«Feeling angry» (0,39), «Trait anger» (0,61), «Angry temperament» (0,48), «Angry reaction» (0,46), «Anger expression-out» (0,39)
Stimulant addiction $p < 0,05$	«Physical aggression»	«Trait anger» (0,43), «Angry temperament» (0,35), «Angry reaction» (0,42), «Anger expression-out» (0,40)
	«Verbal aggression»	«Trait anger» (0,42), «Angry temperament» (0,51), «Angry reaction» (0,39), «Anger expression-out» (0,51), «Anger control» (–0,29)
	«Indirect aggression»	«Trait anger» (0,42), «Angry temperament» (0,35), «Angry reaction» (0,41), «Anger expression-out» (0,59), «Anger control» (–0,28), family conflict because of drug use (–0,30)
	«Aggression index»	«Trait anger» (0,45), «Angry temperament» (0,42), «Angry reaction» (0,42), «Anger expression-out» (0,53), «Anger control» (–0,25), irritability (0,46), dysphoria (0,32)

The level of «anger reaction» in polysubstance users was higher compared to other subjects.

Polysubstance and alcohol users demonstrated higher levels of «anger expression-in» than other participants ($p < 0,05$).

Control group participants had lower levels of «anger expression-out» compared to opioid-, polysubstance-, and stimulant-dependent patients ($p < 0,05$).

The highest levels of «anger expression-out» were showed by polysubstance users compared to alcohol and control groups ($p < 0,05$).

Correlation analysis result. Correlation analysis revealed a large number of statistically significant correlations; results are presented in table 5.

Regression analysis results. We used results of STAXI and Buss-Durkee scales as dependent variables; social and clinical data was used as independent variables. The linear regression models were built for the study groups; we used the linear regression of $Y = B_0 + B_1X_1 + B_2X_2 + \dots + B_nX_n$ type where Y is a dependent variable and represents one of the anger or aggression indicators; $X_1, X_2, \dots, X_n$ are the independent variables; and, $B_1, B_2, \dots, B_n$ are the coefficients, B_0 is a constant.

For each model we have calculated the levels of statistical significance for each of the predictors and adjusted R^2 (coefficient of determination) that was used to calculate the proportion of response variation "explained" by the predictors in the model.

Opioid dependence. We have built a model for variable «trait anger», predictors identified were: $B_0 = 1,04$, explosiveness ($B_1 = 5,85$), irritability ($B_2 = 5,84$), reported need for treatment ($B_3 = 3,62$), $R^2 = 0,76$. For variable «anger temperament» we found predictors: $B_0 = -1,09$, explosiveness ($B_1 = 2,30$), need in family life ($B_2 = -2,08$), reported need in treatment ($B_3 = 1,88$), $R^2 = 0,58$. Model for «anger expression-out» found the following predictors: $B_0 = 17,64$, emotional lability ($B_1 = 6,36$), apathy ($B_2 = 3,55$), age ($B_3 = -0,37$), $R^2 = 0,72$; for «physical aggression»: $B_0 = 7,35$, emotional lability ($B_1 = 29,48$) and lifetime use of hallucinogens ($B_2 = -22,39$), $R^2 = 0,64$; for «verbal aggression»: $B_0 = 6,39$, lifetime use of hallucinogens ($B_1 = -28,69$), emotional lability ($B_2 = 24,22$), satisfaction with employment ($B_3 = 7,76$), time since last drug use ($B_4 = -0,63$), $R^2 = 0,71$.

Stimulant dependence. Regression model for variable «angry reaction» found the following predictors: $B_0 = -1,56$, explosivity ($B_1 = 3,44$) and education ($B_2 = -1,95$), $R^2 = 0,68$; for «indirect aggression»: $B_0 = 5,37$, emotional lability ($B_1 = 24,75$), $R^2 = 0,71$.

Polysubstance dependence. In the model for «trait anger» the predictor was: $B_0 = -5,01$, apathy ($B_1 = 5,02$), $R^2 = 0,65$; for «anger expression-out»: $B_0 = 12,40$, emotional lability ($B_1 = 4,58$), irritability ($B_2 = -3,53$), length of drug use ($B_3 = 0,03$), $R^2 = 0,84$; for «indirect aggression»: $B_0 = 4,07$, apathy ($B_1 = 22,76$), $R^2 = 0,84$.

Alcohol dependence. For «anger expression-out» predictors were: $B_0 = 17,64$, satisfaction with employment ($B_1 = -1,92$), age of first drug use ($B_2 = -0,28$), $R^2 = 0,75$; for «indirect aggression»: $B_0 = 9,92$, emotional lability ($B_1 = -13,28$) and age ($B_2 = -1,91$), $R^2 = 0,85$.

4. DISCUSSION

The study results demonstrate that drug use and characteristics of aggression are correlated; different types of addiction have significant differences in the profile of aggression. These findings are in agreement with previous studies (Nichols, Mahadeo, Bryant, & Botvin, 2008). The indicators of «physical», «indirect», and «verbal» aggression are the highest at the group of subjects with polysubstance dependence. These findings are consistent with results of G.S. Rajesh studies (Rajesh, 2005; Tardiff, Marzuk, & Leon, 1997) and indicate that for polysubstance users demonstrate higher levels of aggression than subjects abusing only one substance. Patients with polysubstance dependence demonstrate more severe psychopathological symptoms during withdrawal syndromes and in postwithdrawal periods. These disorders are caused by complex impact of stimulants and depressants causing severe dysfunction of neuromediator system (WHO, 2004).

The study results demonstrate that drug users with polysubstance dependence show high levels of emotional lability, hyperesthesia, dysphoria, irritability, and explosiveness that potentiate aggressive behaviour. In the polysubstance users group we have found highest levels of «trait anger», «anger reaction», «anger expression-out». Pronounced reaction of anger facilitates and contributes to the aggressive response. The combination of «feeling angry» and «verbal» aggression is specific for the polysubstance users. Relatives' intervention to stop drug use facilitates longer remissions in this group. The older the subjects were and the longer their polysubstance use was, the lower the levels of verbal aggression were.

The earlier studies using STAXI demonstrated that for drug users who routinely combine various substances anger symptoms are higher than normal; decrease of «anger reaction» levels during the treatment makes treatment more effective and facilitates better social functioning (Fernandez & Scott, 2009). Also, anger as a part of negative affective reaction influences drug use levels (Nichols, Mahadeo, Bryant, & Botvin, 2008).

Stimulant-dependent participants had higher levels of «indirect» and «verbal» aggression than subjects from alcohol - dependent and control groups. Stimulant-dependent subjects were more irritable and explosive; had higher levels of hyperesthesia, dysphoria, and emotional lability. The data also show that combination of these factors can exacerbate expression of aggression. Other studies demonstrated that longitudinal intoxication with stimulants subjects showed frequent emotional and behavioural changes from friendly to aggressive, lower level of self-control, increase of psychomotor activity and initiation of psychotic disorders (Zweben, Cohen, & Christian, 2004; Pihl & Peterson, 1995). These changes result from stimulants effects on the monoamine system and the positive reinforcement centers. Hyperstimulation of the central nervous system is accompanied by changes of the metabolism of neurotransmitters: serotonin, dopamine, norepinephrine that causes disinhibition of mental activity (WHO, 2004; Rohlina & Kozlov, 2001).

«Trait anger» and «anger expression-out» are significantly more often observed in the stimulant group than in control group: a clue that means that anger in this group has a significant influence on the reactive behaviour. Severity of anger reactions in stimulant users increases their social disadaptation (Hien, Cohen, & Caldeira, 2010). High levels of «anger control» at this group prevents subjects from expressing of «indirect» aggression and decreases the «aggression index», although one of the group features for the stimulant users is high level of suspiciousness.

The minimal levels of health care and treatment seeking in the case of stimulant dependency are related to lower severity of stimulant withdrawal syndrome (Carlson et al, 2010).

For the opioid-dependent group the «indirect» and «verbal» forms of aggression are typical in combination with high levels of «guilt» and «resentment». The patients from the opioid-dependent group demonstrate high levels of depression, anxiety, and apathy that moderate aggression. Regular use of opioids affects opioid neurotransmission that causes affective and behavioural disorders (WHO, 2004; Rohlina & Kozlov, 2001).

Results of our study show decrease of «indirect» aggression levels in older opioid users; lower levels of «verbal» aggression correlate with periods of abstinence in the past. «Trait anger» and «anger expression-out» indicators in the opioid-dependent group are higher than in control group. According to Aharonovich et al. (Aharonovich, Nguyen, & Nunes, 2001), opioid and cocaine abusers demonstrate high levels of anger and depression; anger is more typical for the stimulant users and depression for opioid users.

Our data reflects decreasing of «anger expression-out» in opioid-dependent patients with age; «aggression index» correlates with «feeling angry»; «trait anger» component has a negative correlation with having long remissions in the past.

Alcohol-dependent subjects demonstrated significantly higher levels of «resentment», «guilt», and «aggressive and hostility indexes» than the control group. Anxiety, apathy, and depression that are frequent in this group might be aggression-controlling factors; subjects from this group also demonstrate decrease in «indirect» aggression with age.

Alcohol-dependent patients in our study were older, had later onset of addiction problems and longer period since the onset; the period since onset of addiction is positively correlated with levels of «verbal» aggression that confirms results of M.K. Keiley (Keiley, Keller, & El-Sheikh, 2009) who suggests that «verbal» and «physical» aggression increase with the length of alcohol dependence. According to A.K. Miczek (Miczek, 2011) high levels of aggression in alcohol-dependent patients result from alcohol effects on human physiology. B. Fuller et al. (Fuller, Chermack, & Cruise, 2003) demonstrated that alcohol-induced aggression is related to two groups of factors – genetic and intoxication-triggered. Also, aggressive behaviour in alcohol-dependent subjects may be related to psychoorganic syndrome (Schuckit, 2000) that causes less self-control and higher levels of violent behaviour (Berglund & Tunving, 1985).

Alcohol-dependent subjects reported higher levels of «trait anger» and «anger expression-in» than in control group.

Patients who had frequent treatment episodes in the past demonstrated increased levels of «state anger» and «verbal» aggression.

High levels of «physical aggression» for the patients from this group correlate with «state anger» and lack of «anger control-out».

Unlike other groups, alcohol-dependent patients who had multiple treatment episodes have higher levels of «verbal» aggression and «trait anger».

We have found that emotional lability in substance-dependent patients is a general factor that precedes various forms of anger and aggression. Specific predictors of anger and aggression for opioid-dependent patients are: the declared decision to receive drug treatment, no need in family life, satisfaction with current employment, no hallucinogenic substances use in the past. For stimulant users the predictor is fewer years of education, while for polysubstance users – apathy and longer period since first drug use, and for alcoholics – low satisfaction with current employment and early age of first drink.

Our study demonstrated that anger and aggression levels depend on type of drug used and clinical, social and demographical characteristics of the patients. The highest indicators of various forms of aggression are typical for the polysubstance users; stimulant users have lower levels of aggression than polysubstance users but higher than other participants; opioid users are more aggressive than alcoholics and subjects from the control group. In all groups of dependent patients «anger» and «aggression» indicators are higher than normal. Emotional instability of polysubstance and stimulant users contributes to their aggressive behaviour.

Depression, anxiety, apathy that are specific for opioid and alcohol users have limiting effects on their aggression. Anger and irritability are common among all substance-dependent groups. The «anger expression-out» induces other forms of aggression. Aggression and anger predictors vary from substance to substance. Knowledge of these predictors and specific features of anger and aggression may be used for treatment and prevention planning.

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