COGNITIVE DISORDERS IN FEMALE
ALCOHOLIC PATIENTS

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Abstract:
Background: Different cognitive dysfunctions (on attentional, executive tasks) have been noticed during alcohol intoxication, cessation, early and late abstinence, and in chronicity. Acute effects of moderate drinking include impaired immediate learning, and subsequent retrieval of information learned while intoxicated. As alcohol dependence progresses, thinking becomes less flexible, with diminished capacity of problem solving, abstract thinking, conceptualization, and simplistic strategies.
Aims: To investigate gender specific cognitive deficits in alcohol dependence during immediate abstinence and to reveal the influence of the consumption patterns on cognition.
Material and Methods: 77 patients (31 males and 46 females), recruited from Second Psychiatric Clinic Cluj-Napoca, diagnosed with alcohol dependence and thirty matched healthy control subjects participated in the study. The Michigan Alcoholism Screening Test (MAST) has been administrated prior to any cognitive task; following cognitive tests were performed on patients (at baseline-after ten days of abstinence, called immediate abstinence), and on controls: for memory (Rey test, Digit span forward, backwards), verbal memory (RAVLT), attention, processing speed, executive functions (TMA, TMB, Digit symbol).
Results: Alcoholic patients scored modest on visual memory, verbal memory tasks. Regarding attention, processing speed, executive function, there could be noticed a split within the alcoholic group, the younger ones solving more rapidly these tasks. Alcoholic women score more modest than alcoholic men on tasks investigating immediate memory, short term visual memory, visual learning. There were no significant gender differences regarding short term verbal memory, auditory verbal learning, visuospatial processing, processing speed, and executive functions.
Conclusion: alcoholic patients reveal cognitive deficits on all cognitive domains, compared with their healthy counterparts. Gender disparities in favor of men, despite longer duration of drinking and higher quantities of alcohol, were seen for immediate memory, short term visual memory, visual learning.
Key words: cognitions, feminine alcoholism

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Rezumat:

Introducere: Diverse disfuncții cognitive (în special deficite atenționale și ale funcțiilor executive) se observă în timpul intoxicației alcoolice acute, în sevraj, în abstinența imediată și timpurie, în cronicitate. În timpul intoxicației acute alcoolice se constată învățare și evocări problematicate a informației achiziționate. Cu progresia maladiei, procesele gândirii devin mai puțin flexibile, cu diminuarea capacității de gândire abstractă, conceptualizare, cu strategii simpliste de rezolvare.

Obiective: Investigarea tulburărilor cognitive specifice de gen în abstinența imediată și evidențierea influenței diverselor stiluri de consum de alcool asupra cogniției.

Materiale și metode: 77 pacienți (31 bărbați și 46 femei) internați la Clinica Psihiatrie II Cluj-Napoca și 30 de subiecți martori au participat la studiu. Pacienților li s-a aplicat 10 zile de abstinență Michigan Alcoholism Screening Test (MAST) și martorilor testul Rey, Digit span direct, indirectpentru memorie, RAVLT pentru memorie verbală, TMA, TMB, Digit symbol pentru investigarea atenției, vitezei de procesare, funcțiilor executive.


Concluzii: Se constată deficite cognitive globale la pacienții alcoolici. Disparitățile de gen se înregistră în favoarea bărbaților în ciuda cantităților de alcool mai mari consumate și duratei mai îndelungate de consum, mai ales în ceea ce privește memoria imediată, memoria vizuală de scurtă durată, învățarea vizuală.

Cuvinte cheie: cogniții, alcoolism feminin

BACKGROUND

Different levels of cognitive dysfunctions have been noticed during alcohol intoxication, especially on attentional, executive tasks (1), cessation, early and late abstinence (2), and in chronicity or within the complications or end states. Besides blackouts during acute alcohol intoxication, even moderate drinking may be involved in reversible cognitive deficits with protracted abstinence.

These global cognitive impairments are slightly detectable only by psychometric tools at the onset of the dysfunctional alcohol intake behavior, becoming more obvious over time. Acute effects of moderate drinking include impaired immediate learning, and subsequent retrieval of information learned while intoxicated (2). Selective processing of cues indicative of social threat is responsible for the maintenance of a certain level of social anxiety, whereas alcohol use disorders are supposed to develop impairments in information processing that accompany alcohol consumption, which inhibit elaborative processing of stressful or anxiety-related cues, or restrict attentional capacity to immediately salient stimuli (3).

As alcohol dependence progresses, thinking becomes less flexible, with diminished capacity of problem solving, abstract thinking, conceptualization, and simplistic strategies; these above mentioned decreased executive functions, regulated by the prefrontal cortex, may be involved in regulating different behaviors, that escape an efficient anticipation of future consequences, like violence, risk driving (1).
Alcohol consumption and abuse may be explained by the theory of metacognitions (awareness of the current state of cognition, and appraisal of the significance of thought and memories). Positive metacognitions about alcohol argue alcohol consumption as a means of cognitive-affective regulation (4). Negative metacognitions regarding alcohol concern the perception of lack of executive control over behavior (4).

Although masculine alcoholism exceeds epidemiologically that of feminine alcohol dependence, this gap tends to be equalized; the pattern of alcohol consumption follows a clear cut gender pattern (solitary, stigmatizing, hidden in women), with more rapid and deep social, somatic and cognitive decline in women (5, 6).

**Aims:** To investigate gender specific cognitive deficits in alcohol dependence during immediate abstinence and to reveal the influence of the consumption patterns on cognition.

**MATERIAL AND METHODS**

77 patients (31 males and 46 females), recruited from Second Psychiatric Clinic Cluj-Napoca, diagnosed according to ICD-10 and DSM-IV-TR criteria with alcohol dependence and thirty matched healthy control subjects participated in the study. The Michigan Alcoholism Screening Test (MAST) has been administrated prior to any cognitive task in order to characterize drinking habits only to alcoholic patients; various cognitive tests were performed on patients (at baseline-after ten days of abstinence, called immediate abstinence), and on controls: for memory (Rey test, Digit span forward, backwards), verbal memory (RAVLT), attention, processing speed, executive functions (TMA, TMB, Digit symbol). Other psychiatric, neurological and somatic comorbidities, that could affect cognition, were excluded.

Statistical analysis has been performed with SPSS program, version 15. *t* test has been employed for the comparisons of the independent samples; *t* test was used to compare samples at different time points; χ².criterion has been used for gender comparisons.

**RESULTS**

The two groups (patients and controls) were homogenous regarding age (mean 46, 97 years of patients with standard deviation-SD=8, 62, versus mean 42, 4 years-SD=11, 83 in controls) and educational level (mean 10, 80 years with SD=2, 85 in patients versus 12 years-SD=3, 31 in controls). The duration of alcohol consumption recorded 13.7 years in women, SD=5, 72 versus 17.5 years in men, SD=8, 14, (t=2, 69, DF=75 and p=0,017). The quantity of alcohol beverages significantly exceeded in men over women (t=2, 87, p<0.05); women drink 12, 79 sd (standard drink), SD=6, 98, while men drink 17, 75 sd (SD=8, 06) every day.

Visual memory, explored by the Rey test, revealed following results: the mean scores were 23, 69, SD=10.18 for alcoholics versus 44, 43, for controls. The comparison of these means by T test shows a difference of -21.04 (confidence interval 95% ranges from-25,22 to -16,86; due to the fact that this interval does not contain the point 0.00, the difference is significant at the level 5%) (Fig. 1).
Verbal learning, tested by RAVLT, emphasized the following mean values: M = 44.20, SD = 9.40 for alcoholic patients and M = 56.96, SD = 4.91 for controls; the difference between the two groups -12.75 (confidence interval of 95% ranges from -16.34 to -9.17 (due to the fact that this interval doesn’t include the point 0.00, the difference is statistically significant at 0.05%) (Fig. 2).

Attention, processing speed, executive functions, explored by TMA, TMB, Digit symbol revealed the following results (Table 1): the mean values of the time scores on TMA of alcoholic patients less than 45 years of age (M = 62.57, SD = 19.85) were significantly shorter than those realized by older alcoholic patients (M = 76.76, SD = 25.47) (Table no1).

<table>
<thead>
<tr>
<th></th>
<th>Patients ≤ 45 years</th>
<th>Patientsi ≥ 45 years</th>
<th>t</th>
<th>p</th>
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<tbody>
<tr>
<td></td>
<td>N = 35</td>
<td>N = 42</td>
<td></td>
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<tr>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>TMA</td>
<td>62.57</td>
<td>19.85</td>
<td>76.76</td>
<td>25.47</td>
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<tr>
<td>TMB</td>
<td>173.20</td>
<td>74.44</td>
<td>186.33</td>
<td>80.93</td>
</tr>
</tbody>
</table>
Table 1. Results of alcoholic patients on TMA, TMB, Digit symbol

| Digit Symbol | 39,54 | 15,74 | 34,09 | 13,32 | 1,64 | 0,104 |

No significant differences between the two sample could be noticed on TMB ($t = -0,73$, $df = 75$, $p = 0,465$), respectively Digit symbol ($t = 1,64$, $df = 75$, $p = 0,104$) (Table 2).

A further analysis regarded the gender comparison inside the alcoholic sample. From all data, we shall point the results on a memory task, Digit span forward and backwards (Fig. 3).

The comparison of mean scores ($t$ test) on the forward task emphasized significant gender differences ($t = 2,62$, $df = 75$, $p = 0,010$), men scoring higher ($M = 5,29$, $SD = 1,18$) than women ($M = 4,67$, $SD = 0,87$). On the backwards task, men score also higher ($M = 3,48$, $SD = 1,31$) than women ($M = 3,48$, $SD = 1,31$), the difference being not statistically significant ($t = 1,11$, $DF = 75$, $p = 0,269$).

A further aim of the current study is to reveal the influence of drinking habits on cognitive tasks (Table 2).

<table>
<thead>
<tr>
<th>RAVLT ($N = 46$)</th>
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<td>duration</td>
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Fig. 3. Gender distribution of results on Digit span forward and backwards in the alcoholic sample.

<table>
<thead>
<tr>
<th>RAVLT ($N = 46$)</th>
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<tr>
<td>trial 1</td>
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<tr>
<td>duration</td>
</tr>
<tr>
<td>(years)</td>
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<tr>
<td>---------</td>
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<td>Quantity (sd/day)</td>
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Table 2. Relation between drinking habits and RAVLT

A negative significant correlation could be established between duration of alcohol consumption and the results on RAVLT first trial (r = -0.369, p < 0.05), 5th trial (r = -0.292, p < 0.05), recognition (r = -0.410, p < 0.01), and total RAVLT (r = -0.323, p < 0.05) (Table 2). No significant correlation between the quantity of alcohol intake and results on RAVLT could be noted.

A significant positive correlation (R = 0.324, p < 0.05) between the duration of drinking and time scores on TMA and a negative significance (r = -0.458, p < 0.01) between duration of alcohol intake and results on Digit symbol test could be noticed.

DISCUSSION
The overall modest scores on cognitive tasks are concordant with other authors (7, 8, 9, 10), while few (11) did not notice any cognitive impairments.

CONCLUSION
Alcoholic patients reveal cognitive deficits on all cognitive domains, compared with their healthy counterparts. Gender differences of drinking habits revealed a shorter duration and smaller quantities of alcohol intake in women than men.

The current study emphasized the fact that alcoholic women score more modest than alcoholic men on tasks investigating immediate memory, short term visual memory, visual learning. There were no significant gender differences regarding short term verbal memory, auditory verbal learning, visuospatial processing, processing speed, and executive functions.

REFERENCES