

Association of Vitamin D3 Level with Criminal Behavior and Alcohol Concentration in Drunk People

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ABSTRACT

The Current study was suggested to evaluate the vitamin D3 (VD3) level in drunks in Iraqi population and detected the role of VD3 in criminal behavior and correlation with Alcohol level, results show non sig. differences of age VD3 and significant elevation was observed of drunks body mass index (BMI). Alcohol concentration was 66 mg/cm³ in drunks. There were non-significant variations in VD3 and Alcohol levels in age and categories ($p < 0.426$, $p < 0.692$), respectively. The BMI categories observed to be affected in Alcohol level, obese has a high level of alcohol while the overweight has lower than normal W. but in non-significant differences ($p 0.083$). Slight variations were found in the VD3 level in non-sig differences also ($p 0.650$), The residence of drunks was significant effected in the VD3 that elevated in rural than urban ($p < 0.042$) while didn't affect in the alcohol levels (0.815). The employment did not affect both VD3 and alcohol levels ($p < 0.895$, $p < 0.161$), respectively, The criminal behavior of drunks recorded low level of VD3 in the Paraphilias and high level in normal drunk than other criminal behavior in non-significant differences ($p < 0.173$). The level of alcohol also affected by criminal behavior in non-significant differences low level was observed in the drunks with position of drink and high level in the normal drunks ($p 0.876$). The correlation between VD3 and alcohol levels show non-significant weak inverse relation ($r -0.275$, $p < 0.255$). From current output, it can be concluded that VD3 may be affected in criminal behavior of drunks.

Keywords: Alcohol level, Criminal behavior, Drunks, Vitamin D3.

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INTRODUCTION

The vitamin types have been widely studied because of the role in vital processes and their deficiency causes health problems, vitamin D is one of the important vitamins that was appeared to be insufficient among the individuals.¹ The deficiency of vitamin D deficiency contributed to a variety of disease and disorder like low mood disorder and cognitive impairment in elderly people,² including Alzheimer's disease.³ And major mental disorders, for instance depression^{3,4} schizophrenia¹ and psychotic symptoms,^{5,6} evidence found that the low vitamin D serum concentration was associated with alcohol use disorders.^{7,8} The alcohol abuse participates in health problems like induced oxidative stress (Das and Vasudevan, 2007), cancer, infectious diseases, diabetes, neuropsychiatric diseases (including alcohol use disorders), cardiovascular disease, disease of liver and pancreas, in addition to injury of unintentional and intentional (Rehm, 2011). Among the most prevalent mental disorders worldwide is Alcohol use disorder, also related to some physical and psychiatric comorbid conditions.¹⁰ The present study aims to evaluate the VD3 level and its relationship with criminal behaviors of drunks in Iraqi individuals.

METHODOLOGY

Study samples and data collection: a drunken individual that sent by judicial writ to Al-Mahaweel Hospital to detect the alcohol level in their serum were included in the present study with ethical approval of sample collection from each contributor, blood was collected then serum was isolated to detect VD3 and Alcohol levels.

Data analysis: all data represented in tables as mean \pm stander deviation, ANOVA one way and independent t test were used to significant differences detected at p-value < 0.05 . the correlation coefficient between VD3 and alcohol also detected at p 0.05.

RESULTS

Table 1 explain the study variables included age, BMI and VD3 level in addition to the concentration of Alcohol in drunks, non sig. differences of age VD3 and significant elevation was observed of drunks BMI. Alcohol concentration was 66 mg/cm³ in drunks.

There were non-sig variations in VD3 and Alcohol levels in age and categories ($p 0.426$, $p 0.692$) respectively, the BMI

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categories observed to be effected in Alcohol level, obese has a high level of alcohol while the overweight has lower than normal W. but in non-significant differences (p 0.083), slightly variations were found in the VD3 level in non-sig differences also (P 0.650) (Table 2).

The residence of drunks was significant effected in the VD3 that elevated in rural than urban (p 0.042) while didn't affect the alcohol levels (0.815). The employment didn't affect both VD3 and Alcohol levels (p 0.895, 0.161) respectively (Table 3)

The criminal behavior of drunks recorded low level of VD3 in the Paraphilias and high level in normal drunk than other criminal behavior in non-significant differences (p 0.173). The level of alcohol also affected by criminal behavior in non-significant differences low level was observed in the drunks with position of drink and high level in the normal drunks (p 0.876) (Table 4).

The correlation between VD3 and alcohol levels shows non-significant weak inverse relation (r -0.275, p 0.255) (Figure 1).

DISCUSSION

The current associations between VD3 and alcohol in several factors show non-significant effected of VD3 and alcohol, although of the variations in some factors, also the differences between drunks and control group didn't observe its rapprochement in the VD3 in both groups (table1). The alcohol level in control was extremely low, thus it is considered that its zero. Evidence refers to vitamin D levels in alcoholic patients remain controversial as some studies have not found

an association between VD3 an alcohol while others found negative and positive relation between them (Vitor *et al.*, 2017). The significant differences observed in the residence of drunks, the rural was higher than urban in VD3 and this may be belonged to the lack of sunlight exposure, the types of nutrition's. Another slight differences may be because of a direct effect of alcohol on vitamin metabolism (Laitinen and Välimäki, 1991; Sampson, 1997).

The other reasons of slight differences of VD3 between study factors are low absorption of vitamin D that lead to reductions in levels of vitamin-D binding protein, or a decreased hydroxylate vitamin D ability in the liver (Laitinen and Välimäki, 1991), studies deal with elderly people, which deal with the present findings that non-significant relation between serum 25(OH)D level and alcohol intake (Jacques *et al.*, 1997; Egan *et al.*, 2008). On the other hand, a study conducted by Lee, (2012) found non-significant association between alcohol intake and serum 25(OH)D level in women, while the positive association evident only in men.

The association of vitamin D deficiency with criminal behavior did not full study, but the role of VD3 in brain health has been described. Investigations clarified the role of vitamin D in the maintain important body functions like neurodevelopment and its deficiency has been linked to many mental disorder problems such as dementia, depression, diabetes mellitus, autism, and schizophrenia (Anjum *et al.*, 2018). Also, VD3 and changing in its receptor impact on different brain neurotransmitters. Thus, it leads to propose a

Table 1: The means of study variables (age, BMI, VD3) of the drunks and control, alcohol level in drunks

| Subjects | VD3 ng/mL | Age Year | BMI Kg/m ² | Alcohol level mg/cm ³ |
|----------|--------------|---------------|-----------------------|----------------------------------|
| Drunks | 24.03 ± 9.83 | 30.05 ± 11.53 | 27.07 ± 2.98 | 66.00 ± 25.34 |
| Control | 23.52 ± 7.42 | 26.66 ± 4.463 | 24.81 ± 3.80 | 0 |
| Sig | 0.842 | 0.172 | 0.036* | - |

Table 2: The VD3 and Alcohol level in drunks according to age, BMI and duration of abuse categories

| Subjects | VD3 ng/mL | Alcohol level (mg/cm ³) |
|-----------------------|----------------|-------------------------------------|
| <i>Age categories</i> | | |
| Less than 30 | 22.61 ± 8.79 | 67.83 ± 26.15 |
| More than 30 | 26.47 ± 11.72 | 62.85 ± 25.58 |
| Sig | 0.426 | 0.692 |
| <i>BMI</i> | | |
| Normal W. | 23.620 ± 10.29 | 74.80 ± 34.07638 |
| Over W. | 22.58 ± 9.08 | 54.30 ± 7.64 |
| Obese | 28.20 ± 12.70 | 84.25 ± 33.17 |
| Sig | 0.650 | 0.083 |
| <i>Duration</i> | | |
| Less than 5 years | 23.14 ± 9.02 | 61.81 ± 16.57 |
| 5-10 years | 25.41 ± 13.46 | 73.00 ± 40.78 |
| More than 10 years | 24.80 ± 0.03 | 68.00 ± 0.03 |
| Sig | 0.099 | 0.705 |

Table 3: The VD3 and Alcohol level in drunks according to residence and Employment

| Subjects | VD3 ng/mL | Alcohol level mg/cm ³ |
|-------------------|---------------|----------------------------------|
| <i>Residence</i> | | |
| Rural | 32.75 ± 14.59 | 68.75 ± 33.18 |
| Urban | 21.71 ± 7.16 | 65.26 ± 24.22 |
| Sig | 0.042* | 0.815 |
| <i>Employment</i> | | |
| Employee | 22.50 ± 12.75 | 77.60 ± 43.82 |
| Non-employee | 24.98 ± 10.24 | 56.54 ± 6.69 |
| Free work | 23.13 ± 2.88 | 81.33 ± 23.09 |
| Sig | 0.895 | 0.161 |

Table 4: The VD3 and Alcohol levels in drunks according to criminal behaviors of drunks

| Criminal behavior | VD3 ng/mL | Alcohol level mg/cm ³ |
|----------------------------------|-----------------|----------------------------------|
| Violent | 22.00 ± 8.05757 | 64.40 ± 25.77768 |
| Paraphilias | 20.78 ± 5.29 | 67.00 ± 23.53 |
| Normal drunk | 35.23 ± 16.81 | 75.00 ± 37.64 |
| Drunk with Possession of a drink | 27.10 ± 0.04 | 50.00 ± 0.03 |
| Sig | 0.173 | 0.867 |

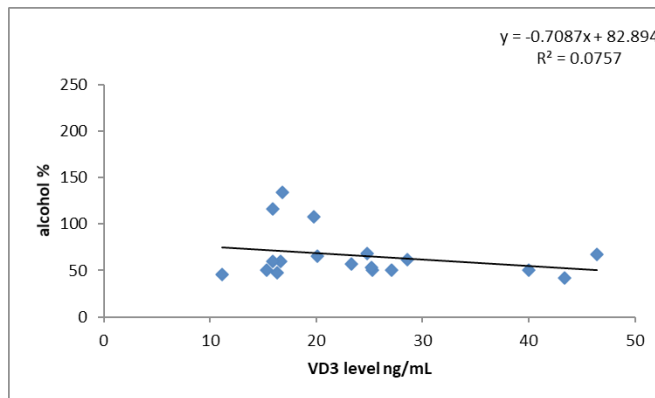


Figure 1: The correlation between VD3 and alcohol level in drunks

potential role of vitamin D in causing and redressing mood disorders (Kiralý *et al.*, 2006). Further, it was found that the VD3 optimal levels are necessary to preserve the neurological development and protect the adult brain (Di Somma *et al.*, 2017). A recent study shows that vitamin D helps in keeping cognitive function in older adults (Lau *et al.*, 2017). However, the VD3 interaction with alteration in widespread neurotransmitter included glutamine and noradrenaline. In addition to changes to regionally selective neurotransmitter included dopamine and serotonin, this evidence concluded that the VD3 insufficiency leads to these brain modifications (Pertile *et al.*, 2016; Kesby *et al.*, 2017). As a result of VD3 effected in dopamine it used with existing treatments for Parkinson’s disease (Orme *et al.*, 2016). From this evidence and the present outputs, we can conclude that VD3 is may be contributed to the criminal behaviors in drunks among the Iraqi

population, the present finding requires other investigations and large sample size.

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