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Original article

Glare recovery time in Chronic Alcoholics

Joginder Sidhu[1*] , Vishavdeep Kaur[2] Hasrat sidhu[3]

[1]Associate professor, Department of Physiology, Dayanand Medical College and Hospital, Ludhiana, India.
[2]Assistant professor, Department of Physiology, Dayanand Medical College and Hospital, Ludhiana, India.
[3]Final year MBBS, Dayanand Medical College and Hospital, Ludhiana, India.

ABSTRACT

Back ground: Alcohol leads to structural and functional damages in the brain areas leading to decrease in reaction times and also prolongation of glare recovery time. There are very few longitudinal studies showing a relationship between chronic alcohol abuse and glare recovery time. Keeping this in mind this study was planned. **Methodology :**The study was conducted on 60 subjects, 30 were chronic alcoholics(group I) presenting to gastroenterology ward of a tertiary care teaching hospital. The other 30 subjects were group II who served as controls (non – alcoholics).After taking written informed consent Glare Recovery Time was recorded using Glare recovery tester (GT-991 Medicaid :Chandigarh).Three recordings were taken and the data was analysed .The mean and standard deviation were computed and comparison was done using unpaired t-test. **Results :**The mean of glare recovery time in group I(chronic alcoholics) was 283.68 and of group II(controls) was 145.07.The standard deviation was238.18 and 71.51 respectively. The t-value was 3.05 and p- value = 0.003 was statistically significant showing a comparable difference in group 1 and II . **Conclusions :**This study showed that chronic alcoholics recorded increased glare recovery time.

KEYWORDS: Chronic alcoholics, Central processing, Nerve conduction , Glare recovery time.

INTRODUCTION

Alcohol is believed to be the oldest drug used by humans[1].The Scottish physician Thomas Trotter was the first to characterize excessive drinking as a disease [2]. Both autopsy and neuroimaging studies of alcohol dependent patients illustrate that chronic alcohol abuse is associated with structural and functional abnormalities in brain areas that organize and co –ordinate motor movements[3,4].Reaction time is the interval between the onset of stimulus and response.

It gives an idea about the integrity and processing ability of the central nervous system[5].An increase in reaction time indicates slow central processing. Glare recovery is the rapidity with which the person's vision functioning returns to what it was before the glare was encountered[6]. Alcohol prolongs the glare recovery time and has a direct effect on the retina. Also[7,8,9,] .Therefore we recorded the glare recovery time in chronic alcoholics to establish that long term alcohol abuse affects the functioning of the retina.

MATERIALS AND METHODS

The study was conducted on 30 patients(group I) presenting to the gastroenterology ward of a tertiary care teaching hospital. 30 age matched controls(group II)were also included in the study. Diagnosis of alcoholism was made based on a detailed history including daily consumption, frequency and duration of consumption. Complete clinical examination was performed and an alcohol use disorder screening test (AUDIT) which is a standardized questionnaire for clinical diagnosis of alcohol abuse was filled .Subjects suffering from diseases affecting vision, retina or the visual pathway were excluded.

A written informed consent was taken from all the subjects. They were thoroughly acquainted with the apparatus and were given three practice sessions before beginning the recordings. Glare Recovery Time was recorded on Glare Recovery Tester (GT-991 Medicaid : Chandigarh). The subjects were presented with a high beam of light which was focussed on the eyes of the subject for a fixed period of

time. As soon as the light stimulation was over a word was displayed on screen which the subject had to read. The time was noted and three readings were taken .The study was approved by the institutional ethics committee.

Statistical analysis – Data was presented as mean ± standard deviation. The comparison of means was done using unpaired t – test .

RESULTS

Thirty chronic alcoholics(group I) and thirty age matched controls(group II) were included in the study .Demographic profile of the subjects with respect to age is shown in table 1 .

Table :1 Age distribution of subjects of group I and group II

Age (years)	Cases(group I)		Control(group II)	
	Number	Percentage	Number	Percentage
21-30	0	0.00	3	10.00
s31-40	10	33.33	8	26.67
41-50	7	23.33	13	43.33
51-60	10	33.33	6	20.00
>60	3	10.00	0	0.00
Mean ± SD	48.13±10.08		43.10±8.56	
p-value	0.04704			

Table 1 shows age distribution of subjects in group I (chronic alcoholics) and group II (controls) . Majority of the subjects in group I were in age group of 31-40 and 51-60 years where as in group II majority of the subjects were in 41-50 years. The mean age of group I subjects was 48.13 and of group II was 43.10. Table 2 shows the comparison between Glare recovery time values of group I (chronic alcoholics) and group II (controls) in milliseconds. The mean value of group 1 was 283.68 and mean value of group 2 was 145.07. The S.D. (standard deviation) values for group 1 and group 2 are 238.18 and 71.51 respectively. The t-value was 3.05. The value of p = 0.003 was statistically significant showing a comparable difference of Glare Recovery Time in both groups .

Table :2 Comparison of glare recovery time(in milliseconds)between group I and group II

Groups	Mean	Standard Deviation
Group I (Cases)	283.68	238.18
Group II(Controls)	145.07	71.51
t-value	3.05	
p-value	0.003	

DISCUSSION

Chronic alcoholics show significant volume loss in cortical and subcortical brain areas [10] Alcohol prolongs time of glare recovery .Similar studies state that alcohol slows dark adaptation and resynthesis of photopigment in albino rats [11] .. Some studies propose that progressive increase in alcohol consumption leads to alterations in brain structures promoting further alcohol abuse and neurodegeneration [12]. Others found alcohol to produce three times more errors on reaction time tasks and two times more in visual structuring task when compared to performance in a placebo (non – alcoholics)[13].

Cirrhotic patients have been reported by some researchers to have abnormal dark adaptation, which frequently does not respond to supplementation with vitamin A[14].Chronic alcohol consumption produces an increase in lipid peroxidation products and a decrease in antioxidant factors and its related enzymes which can eventually induce apoptosis mediated cell death . There are few studies reporting on retinal injury related to oxidative stress induced by alcohol consumption. Ethanol causes abnormal dark adaptation by acting as a competitive inhibitor with retinol for alcohol dehydrogenase in the eye .

CONCLUSION

In summary , the present study found that alcohol impairs glare recovery time , it was increased in chronic alcoholics . It is also known to have a direct effect on the human retina and this reduces performance in many motor tasks like driving , writing , typing etc..Further studies are required to establish a relationship between alcohol and glare recovery time and even female population may be included as prevalence of alcohol intake is increasing amongst the females.

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*Corresponding author: Dr. Joginder Sidhu
E-Mail: drjksidhu@yahoo.co.in