DISSEMINATION OF BIOCHEMICAL MARKERS BETWEEN SALIVA AND SERUM SAMPLES OF ALCOHOLIC PATIENTS

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ABSTRACT :

Alcohol is a psychoactive substance with dependence-producing properties and is typically taken in the form of an alcoholic beverage. It is an ingredient found in beer, wine, brandy, whiskey and rum in the form of ethanol or ethyl alcohol which on ingestion can lead to a state known as alcohol intoxication or drunkenness. The usage of alcohol is often associated with the concomitant abuse of other addictive substances including nicotine. The net effect of harmful use of alcohol is approximately 3.3 million deaths each year and accounts for 5.9% of all deaths worldwide; this is greater than proportion of deaths due of HIV/ AIDS [2.8%] and tuberculosis [1.7%]. Alcohol related harm is determined, apart from environmental factors, by three related dimensions of drinking: the volume of alcohol consumed, the pattern of drinking and the quality of alcohol consumed. The aim of the present study was to investigate the significance of difference between saliva and serum samples in both cases and controls. Totally 30 samples were processed for a period of 3 months duration. Clinical parameters like Flow rate, Specific gravity, Glucose (saliva, serum),Uric acid, Creatinine, Lipid profile and LFT were screened. All the clinical parameters were keenly observed and the results were interpreted with the current status. The result indicates that some of the clinical markers were abnormal than the controls. The study also suggest to avoid alcohol consumption and also this study will be an eye opener for the society to aware about alcohol complications.

Keywords : Salivary Glucose, Serum Glucose ,Alcoholism, BMI, etc

INTRODUCTION

Alcohol is a psychoactive substance with dependence-producing properties and is typically taken in the form of an alcoholic beverage. It is an ingredient found in beer,wine,brandy,whiskey and rum in the form of ethanol or ethyl alcohol which on ingestion can lead to a state known as alcohol intoxication or drunkenness. The commonly consumed alcoholic beverages in India include brewed alcoholic beverages (1)and Indian made foreign liquor (beer, brandy, whiskey, rum and vodka) (WHO,2014).

The mechanisms of harm caused by alcohol consumption in an individual are due to the toxic effects on organs and tissues, intoxication leading to impairment of physical co-ordination, consciousness, cognition, perception, affect or behaviour as well by causing dependence, whereby the drinker's self-control over his or her drinking behaviour is impaired (1).

The usage of alcohol is often associated with the concomitant abuse of other addictive substances including nicotine.The net effect of harmful use of alcohol is approximately 3.3 million deaths each year and accounts for 5.9% of all deaths worldwide; this is greater than proportion of deaths due of HIV/ AIDS [2.8%] and tuberculosis [1.7%]. Alcohol related harm is determined, apart from environmental factors, by three related dimensions of drinking: the volume of alcohol consumed, the pattern of drinking and the quality of alcohol consumed (2),(3).

Salivary amylase is produced by salivary glands and is released predominantly upon adrenergic innervation, amylase in blood is mostly produced and released by pancreas. Pancreatic amylase enters the blood stream and can easily measured in blood. Amylase concentrations are highest in the pancreas and salivary glands, although amylase is abundant in other organs as well. Salivary and pancreatic forms of alpha-amylase have gained interest in a variety of areas . The use of saliva as of substance abuse/dependence and monitoring of substance levels, including alcohol and tobacco, has gained high attention in the recent years (4).

MATERIALS AND METHODS

Study Design

The present pilot study was conducted from January to March 2019 where 30 samples were screened from alcoholic and non alcoholic participates from Korkadu, area, Puducherry, South India. The family history collected from all participates by oral or questionnaire method. The present study was investigated in 30 populations. A total of 5 mL venous blood was collected in alcoholic patients (n=30) and 5 mL of serum sample was used for biochemical analyses of Blood Glucose(GOD-POD), Saliva Glucose(GOD-POD), Urea(Berthelot Method) Uric acid (Uricase Method), Creatinine(Modified Jaffe's Method), Lipid profile(CHOD-POD Method), LFT (DMSO/ DIAZO Method) , undertaken by calorimetric Assay along with Hb, ESR, BP and BMI was also calculated.

Statistical Analysis

Datas were pooled and coded in Microsoft Excel spreadsheet. The data were expressed in the form of Mean ± SD. The student t-test was used to assess the statistical differences between case and control. Graphs were used to represent the results.

RESULT AND DISCUSION

The present study was conducted at Korkadu area, Puducherry, South India. . A total of 30 samples were screened for a period of three months at Biochemistry Dept, Divine Mother College, Korkadu, Puducherry, South India. The alcoholic populations were considered as cases and non-alcoholics were the controls and the data on demographic profile of the study population were presented.(Table.1).The results of biochemical markers between the case and control were exemplified.(Table 1 to Table.2., Fig.1& Fig.2) Based on BMI 53.8% (n=8) of the cases were found obesity but it was only 13.5 (n=2) in control. There is no abnormalities in Blood pressure in both case and control during the observation. Similarly, Blood profile like Hb, ESR are also have no significant difference in both case and control. When analysing the saliva, the specific gravity of saliva from alcoholic patients expressed a vast differences of about 46.6% than the non-alcoholic patients

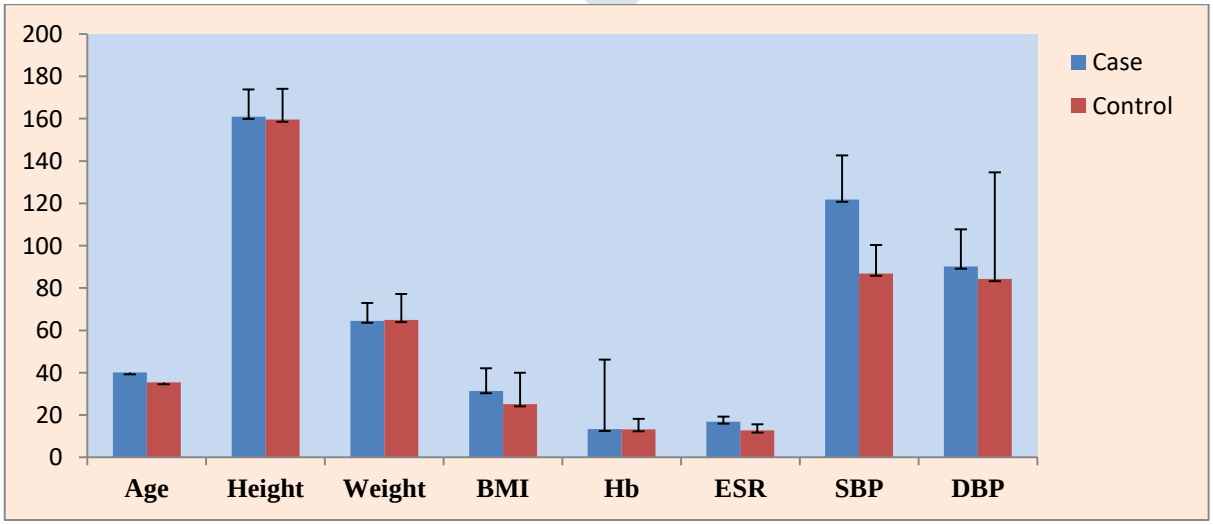

Fig.1. Biochemical Markers for Cases and Controls

Table.1 Mean values for AGE, BMI and Biochemical Markers for Cases and Controls.

Markers	Controls(n=15)	Cases (n=15)	P value
Age	35.5±14.6	40.2±12.9	0.302
Height	160.9±8.40	159.6 ±12.22	0.71
Weight	64.9±14.9	64.5±10.8	0.916
BMI	31.3±32.7	25.1±4.90	0.421
HB	13.43± 2.34	13.28 ± 2.91	0.86
ESR	12.7 ± 13.54	16.9 ± 20.9	0.463
SBP	86.8 ± 50.3	121.8± 17.6	0.006**
DBP	90.2 ± 15.3	84.3 ± 13.29	0.212

Values are given as mean ± SD of 30 patients;

Alcoholics were compared with Non alcoholics.

Datas were analysed with student's ' t' test.

Value are statistically significant at *p <0.001.

The flow rate of saliva also expressed a significant differences includes 46.6% (n=7) showed increased flow rate of saliva but it was only 26.6% (n=4) in control were seen during the investigation. Glucose level in saliva of all the alcoholic samples were raised at a peak level than the non alcoholic sample which were only slight level of increase. Our results were correlated with the earlier reports(5), (6),(7)

20% (n=3) of both case and control were seen with increased levels of blood glucose may be not related to other metabolic defects a problems but increased level of glucose in blood should be notable in alcoholic patients. 26.6% (n=4) were observed with elevation of urea in blood but the urea level in control were higher than cases(8). Creatinine was raised in 53.3% (n=5) of cases and the same was only 33.3% (n=5) in control. The level of uric acid was also elevated in 33.3% (n=5) of cases and 20% (n=1) of control were observed during the present study. The findings of the present study were in agreement with the earlier studies.(9),(10)

On considering the total cholesterol with triglycerides level 46.6% (n=7) of the population has high density of total cholesterol and triglycerides were also observed during the study was in line with previous reports(11). But in case and control the triglyceride were found normal for all the samples and 53.3% (n=8) of the sample has high density of total cholesterol that may be due to other complications like thyroid problem, present life style, etc.(12),(13).

The bilirubin were also found abnormal in 46.6% (n=7) of the screened samples and in particularly in direct bilirubin. Direct bilirubin was high in control samples as the factors already discussed earlier. Estimation of protein is very important in alcoholic patient as protein is one of the major component as well as nutrition for normal function of body.(14)

Table.2 Mean values for clinical markers

Markers	Control (n=20)	Cases(n=20)	P value
Glucose saliva	10.5 ±3.39	19 ±21.9	0.105
Glucose serum	96.5± 21.7	106.7± 27.8	0.214
Specific gravity	0.70 ±0.32	1.12± 0.53	0.005**
PH	6.13± 0.54	5.85± 0.80	0.209
Flow rate	0.47± 0.18	0.79± 0.36	0.001**
Urea	33.5 ±12.1	33.6± 12.8	0.99
Creatinine	1.21± 0.24	1.19± 1.13	0.01*
Uric acid	6.1±2.06	11.8±21.9	0.269
Cholesterol	212±80.6	227.2±81.8	0.564
Triglycerides	119.5±21.3	159.1 ±49.1	0.002**
HDL	44.6±16.9	43.7±17.09	0.873
LDL	157.3± 63.7	134.1± 53.1	0.230
VLDL	25.2± 8.9	36.5± 27.2	0.094
Total bilirubin	0.101 ± 0.209	0.078 ± 0.050	0.637
Direct bilirubin	0.072 ± 0.068	0.052 ± 0.98	0.980
Indirect bilirubin	0.071 ± 0.174	0.037 ± 0.054	0.423
Total protein	6.9 ± 1.11	9.5 ± 9.4	0.245
Albumin	4.28 ± 0.62	5.4 ± 1.23	0.0007**
AST	15.5 ± 18.67	8.92 ± 15.46	0.241
ALT	19.4 ± 28.7	9.27 ± 16.8	0.19
ALP	86.25 ± 22.9	92.7 ± 57.5	0.65

There was a significance different between cases and controls.

*****indicate moderate significance

** indicate strong significant

Values are givens as mean ± SD of 30 patients

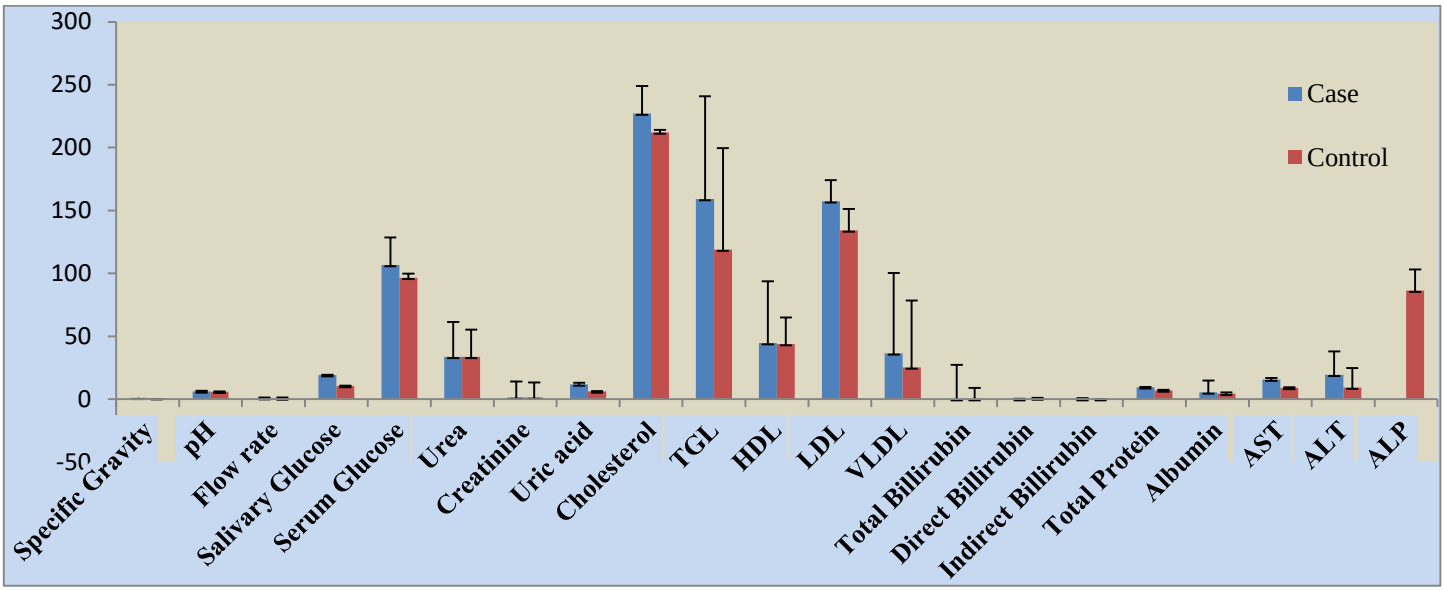

Fig.2. Clinical markers for Cases and Controls

Total protein, Albumin, Serum glutamic pyruvic transaminase, Serum glutamic oxaloacetic transaminase, Alkaline phosphatase were also estimated for both case and control. Increased level of total protein were observed in 66.6% (n=10) of case, 40% (n=6), 6.6% (n=1), (3.3%) (n=2) were found high elevations in their albumin, Serum glutamic oxaloactic transaminase, Serum glutamic pyruvic transaminase and Alkaline phosphatase respectively.(Fig.2) Protein profiles were found normal in all the control during the investigation(15),(16).

CONCLUSION

Based on the present comparative study all the biomarkers clearly indicates the abnormal level of various clinical parameters in the alcoholic patients. High level of cholesterol leads to heart complications more over the alcohol consumption may cause both physiological and psychological complications. Physiological complication like chest pain, heart attack, stroke, tissue damage, arterial disease, kidney dysfunction , epilepsy, hypothyroidism, jaundice and anaemic etc., may occur in alcoholic patients. Psychological complication like loss of social value in the society, loss of income, loss of respect in the family, memory loss etc., may result in alcoholic patient .

As the complication both physiological and psychological will result in disharmony of leading a normal life. So slowly withdrawing the abuse of alcohol and getting rehabilitation may work in those alcoholic patient and they can also return to their normal life is also possible. These kind of study is very essential and sure this study will be an eye opener for the society to be aware about alcohol complications.

CONFLICT OF INTEREST:

"The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper."

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