Section: Community Medicine

Original Research Article

TALE OF A CHRONIC ALCOHOLIC: BIOCHEMICAL ALTERATION, IMPACT ON HEALTH & ECONOMIC BURDEN ON FAMILY

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Abstract

Background: Alcohol abuse has been in the society since medieval ages, and now due to increase production, easy accessibility and affordability of alcoholic beverages, its use has been drastically increased. Alcohol abuse also increases economic burden (3) especially if the earning member of family is an alcohol addict and family is already suffering from massive economic cut-offs. Chronic alcohol abuse has adverse effect on human body, it can affect cardiovascular, renal, hepatic, gastrointestinal, psychiatric, haematological systems of body. Chronic alcohol abuse has shown association with increase LDL: HDL ratio (5), risk for hypertension (6), anaemia (7), pancreatitis (8), diabetes mellitus (9), paranoid personality (10) and electrolyte imbalance (11). In the study we will try to find out the association between various health hazards related to the Chronic alcohol abuse and its economic burden on rest of family by using simple but relevant diagnostic markers. Our study has following objective to find out association between chronic alcohol abuse and its health hazard, its economic burden on the family and association between chronic alcoholism induced pancreatitis (acute or chronic) and diabetes mellitus (as it is not much clear in previous studies). **Materials and Methods:** This is a hospital based cross-sectional study conducted in the department of community medicine and Medical College Hospital of LSLAMGMC, Raigarh, Chhattisgarh for a period from 1st December 2021 to 31st August 2022. The study subjects included patients with regular alcohol consumption. Data was collected through a predesigned questionnaire with required biomarkers and analysis was done. **Result:** A total of 80 patients were analysed, all of them were male. Majority of them were binge drinker with minimum age of 24 and maximum of 67 years old (average 40 years) and consumption year of minimum 5 and maximum 32 and average 12. No exact correlation can be made between consumption pattern, consumption years and pancreatic profile, Cardiac, Renal and Hepatic Profile. Ascites was the only symptom found to in patients followed by jaundice. All the patients enrolled to study were belonged to Lower Socioeconomic status by Kuppuswami scale. All the patients were mild to moderately alcohol addict as per DSM V criteria. 18% of patient were diagnosed to be having paranoid personality, though no correlation can be made with alcohol consumption profile. Most frequently associated social problem found was domestic violence/abuse and child neglect, especially if the alcohol addict is not earning and is the oldest man of the household. In case of earning addict, they spend nearly 36-62% (average 48%) in alcohol consumption related activities. **Conclusion:** It is difficult to establish exact status of alcoholic damage for a particular organ on the basis of biochemical profile. Biochemical profile, though also depends on consumption years, keep altering with respect to recent pattern on drinking. AST: ALT, GGT and LDH might be relatively better marker than other available to identify liver damage. No exact correlations can be established between any biochemical alterations with consumption history. No correlation between diabetes mellitus and alcohol consumption.

INTRODUCTION

Alcohol abuse has been in the society since medieval ages, and now due to increase production, easy accessibility and affordability of alcoholic beverages, its use has been drastically increased. A report published by Economics Times shows increase in alcohol consumption by 37% between 2010 to 2017,[1] whereas a report published by DNA India state that "There is no uniform law related to legal age of drinking in India as it varies from state to state since the subject of alcohol is included in the state list, resulting in increased alcohol intake by teenagers." [2]

Alcohol abuse also increases economic burden,[3] especially if the earning member of family is an alcohol addict and family is already suffering from massive economic cut-offs. Poverty along with alcohol addiction,[4] can have worst effect on family and society of an individual. Sometimes alcoholic also substitute nutritional meal with alcohol.

Chronic alcohol abuse has adverse effect on human body, it can affect cardiovascular, renal, hepatic, gastrointestinal, psychiatric, hematological systems of body. Chronic alcohol abuse has shown association with increase LDL: HDL ratio,[5] risk for hypertension,[6] anemia,[7] pancreatitis,[8] diabetes mellitus,[9] paranoid personality,[10] and electrolyte imbalance.[11]

Chronic alcoholism increases LDL and decreases HDL in serum, which on long term effect can cause atherosclerosis and can lead to coronary artery disease (CAD). There are various studies which has shown increase risk for cardiovascular complication like hypertension, arrhythmias, endocarditis, atrial fibrillation and stroke in long term alcohol addicts.[12]

There is increased risk of chronic pancreatitis and hence diabetes mellitus in Chronic Alcoholism. [8,9]

Prolong chronic alcoholism can cause fatty liver disease and liver cirrhosis and also has various mental implication on the person. [13,14]

In the study we will try to find out the association between various health hazards related to the Chronic alcohol abuse and its economic burden on rest of family by using simple but relevant diagnostic markers (though epidemiology of related health hazards is highly variable and depend on various factors such as age, sex, socio-economic status, number of years since drinking and type of alcoholic beverage consumed).

It is generally found that alcohol addicts with low socio-economic status generally uses locally made (fermented drinks also known as desi) which may contain slight level of methanol (or any other impurities) which might not produce any acute toxic symptoms but on chronic use, can lead to development of some serious problems (pancreatitis, gastrointestinal disturbance, gradual vision loss, etc.).[15]

Objective

Our study has Following Objective

- To find out association between chronic alcohol abuse and its health hazard.
- To find out its economic burden on the family.
- To find out association between chronic alcoholism induced pancreatitis (acute or chronic) and diabetes mellitus (as it is not much clear in previous studies).

MATERIALS AND METHODS

This is a hospital based cross-sectional study conducted in the department of community medicine and Medical College Hospital of LSLAMGMC, Raigarh, Chhattisgarh for a period from 1st December 2021 to 31st August 2022. Ethical clearance was obtained by Institutional Ethics Committee, letter no: S.No/Med./Ethics Commi./2021/161, dated 23/11/21. The study subjects included patients with regular alcohol consumption. Data was collected through a predesigned questionnaire. Hematological profile & serum biochemical analysis was done. Inclusion Criteria was patients who are admitted to the hospital (wards and ICUs), Who have history of alcohol intake for more than 1 year (as per DSM 5 criteria for alcohol addiction), Patients with no underlying etiology related to our study subjects, which can alter the related biochemical & hematological profile. (For e.g.- If a chronic alcoholic patient is admitted due to viral hepatitis, then he will not be applicable for screening related to hepatic complication of chronic alcoholism.) Study instruments included interview Schedule: A pretested questionnaire will be used to collect the socio- demographic details and other relevant data from the patient. We will use DSM-V Screening test for Alcohol Addiction and Paranoid Personality in questionnaire. Collected samples will be sent to Department of Biochemistry & Department of Pathology for biochemical and hematological analysis. The data will be entered into excel sheet and analysis will be done in SPSS. For citation Mendeley and Google Scholar will be used. Interpretation will be made based on lab result, [16,17] and clinical signs & symptoms. Fasting Blood Glucose for >100 mg/ dl or Random Blood Glucose & Post meal Blood Glucose for >140 mg/ dl will be considered as diabetic. Blood Urea (BUN) for >45 mg/ dl, Serum Creatinine (Cr) >1.2 mg/ dl and BUN: Cr for >20:1 will be considered as impaired Renal Function. Serum Sodium, Serum Potassium, Serum & Chloride range is pre fixed between 136-145 mEq/dl, 3.5 mEq/dl & 96-106 mEq/dl, if found out of range will be included as electrolyte disturbance. Serum Bilirubin Total for >1.0 mg/dl or Serum Bilirubin Direct for >0.3 mg/dl or Serum Bilirubin Indirect >1.0 mg/dl will be considered as hyperbilirubinemia, along with clinical signs will be considered as Jaundice. AST for >35 IU/L or ALT for >45 IU/L will be considered as Hepatitis, AST: ALT for more

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than or equal to 2 will be considered as Alcoholic Hepatitis. Elevated Alkaline Phosphatase will be considered if found >150 IU/L, interpretation will be made along will clinically signs. Serum Total Protein (6-8 g/dl), Serum Albumin (3.5-5.2 g/dl), Serum Globulin (2.5-5.2 g/dl), Serum Cholesterol (150-250 mg/dl), Serum LDL (60-200 mg/dl) & Serum HDL (30-60 mg/dl) level are prefixed, interpretation will be made along with the clinical signs. For screening of Alcohol Addiction and Paranoid Personality Disorder DSM-V criteria will be used. Hematological interpretation was made based on clinical signs & symptoms and lab values, by following regular clinical guidelines. (International Society for Laboratory Hematology guidelines). Some of the signs of liver failure are dark urine, pale or bloody or tar colored stool, chronic fatigue, loss of appetite, tendency to burse easily etc. [16] For socio-economic evaluation Kuppuswami scale will be used. Criteria for Ventilation (Adequate/ Inadequate) will be door and window facing each other. Overcrowding will be considered if >2 person per room (150 sq ft size room). Lighting will be considered adequate if the person is able to do daily activities without switching on artificial lights.

RESULTS

During the whole duration of study, a total of 80 patients were analysed, all of them were male, though there were no criteria to not select women, inclusion criteria was only completed by males. Majority of them were binge drinker with minimum age of 24 and maximum of 67 years old (average 40 years) and consumption year of minimum 5 and maximum 32 and average 12. During data collection patients cannot recall the exact consumption years and we doubt the reliability of answer provided by them.

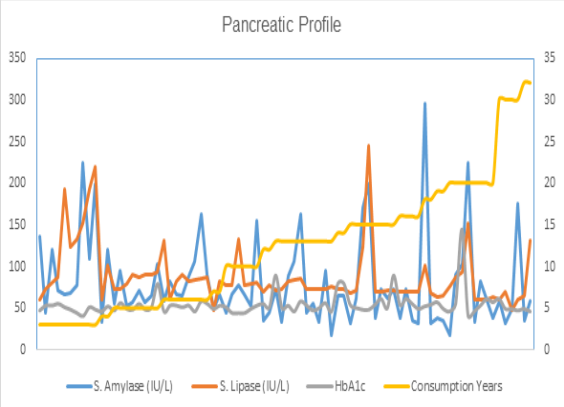

Figure 1: Pancreatic Profile: No exact correlation can be made between consumption pattern, consumption years and pancreatic profile (S. amylase, S. lipase, RBS and HbA1c).

No signs and symptoms were found for chronic pancreatitis and diabetes mellitus irrespective to consumption year, pattern and amount.

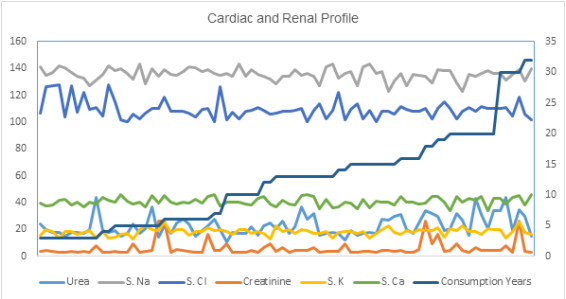

Figure 2: Cardiac and Renal Profile: No exact correlation can be established between any components. Most of the patient had normal or slightly increased blood pressure, which was not yet to be diagnosed for hypertension.

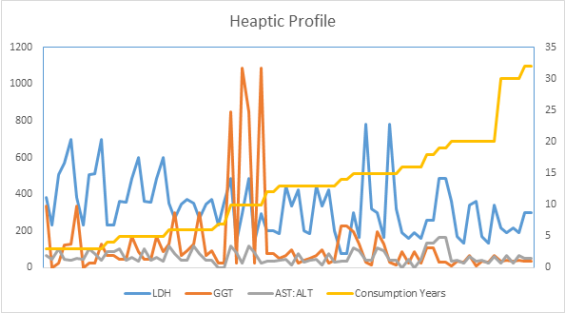

Figure 3: Hepatic Profile: No exact correlation can be made with S. protein, S. albumin, S. globulin, Lipid Profile, ALP, PT, INR, and APTT with alcohol consumption profile. S. bilirubin can act as an indirect of liver damage but cannot be directly linked with chronic alcohol abuse. Relationship can be established between GGT, LDH, AST: ALT with alcoholic liver damage. Ascites was the only symptom found to in patients followed by jaundice.

Psychosocial Profile: All the patients enrolled to study were belonged to Lower Socioeconomic status by Kuppuswami scale. All the patients were mild to moderately alcohol addict as per DSM V criteria. 18% of patient were diagnosed to be having paranoid personality, though no correlation can be made with alcohol consumption profile. Most frequently associated social problem found was domestic violence/abuse and child neglect, especially if the alcohol addict is not earning and is the oldest man of the household. In case of earning addict, they spend nearly 36-62% (average 48%) in alcohol consumption related activities.

DISCUSSION

No similar reported study could be found, but related studies show that although extensive myocardial diseases occur in Chronic Alcoholics, there has not been any mention of biochemical alteration related to cardiac diseases. [18-21] Debate continues regarding the independent contribution of triglyceride levels to CAD risk. In a recent study HDL cholesterol appeared to account for most of the triglyceride-CAD association.[22] Triglyceride value showed a decline in chronic liver disease patients but it was not

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statistically significant.[23] Recent epidemiological & clinical studies have demonstrated that chronic alcohol consumption (more than 3 times (30g) per day) is associated with an increased incidence of hypertension & increased risk of cardiovascular diseases. In both men & women, those reporting consumption of 3 or more drinks daily had higher systolic and diastolic pressure & a higher prevalence of Blood Pressure of 160/95 mm Hg or higher.[24]

CONCLUSION

It is difficult to establish exact status of alcoholic damage for a particular organ on the basis of biochemical profile. Biochemical profile, though also depends on consumption years, keep altering with respect to recent pattern on drinking. AST: ALT, GGT and LDH might be relatively better marker than other available to identify liver damage. No exact correlations can be established between any biochemical alterations with consumption history. No correlation between diabetes mellitus and alcohol consumption.

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