ALCOHOL CONSUMPTION PATTERNS AND LIVER FUNCTION AMONG YOUNG ADULTS: INSIGHTS FROM A CROSS-SECTIONAL STUDY

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Abstract

Background and Objectives: Alcohol consumption is a prevalent behavior among young adults, with potential implications for liver health. This study aims to explore the relationship between various patterns of alcohol consumption and liver function in this demographic group. **Methods:** In this cross-sectional study, 200 young adults were recruited. Participants completed a detailed questionnaire to report their alcohol consumption habits, including frequency, quantity, and type of alcohol consumed. Liver function was assessed through standard biochemical liver function tests. The study focused on identifying patterns in alcohol consumption and correlating these with liver function test results. **Results:** The majority of participants engaged in moderate alcohol consumption, with a significant minority reporting heavy drinking patterns. Analysis revealed a statistically significant association between heavy alcohol consumption and impaired liver function, as indicated by altered liver enzyme levels. However, moderate alcohol consumption showed no significant correlation with liver function impairment. **Conclusions:** This study highlights the potential risks of heavy alcohol consumption on liver function among young adults. It underscores the need for targeted public health interventions and awareness programs aimed at reducing harmful drinking habits in this age group. Further research, particularly longitudinal studies, is essential to fully understand the long-term impacts of different alcohol consumption patterns on liver health.
Keywords: Alcohol Consumption, Young Adults, Liver Function, Cross-Sectional Study.

Introduction

The consumption of alcohol, especially among young adults, has been a subject of considerable public health concern due to its potential impact on various aspects of health, including liver function. The liver, a vital organ responsible for metabolizing alcohol, can be adversely affected by excessive and prolonged alcohol intake. This relationship has been documented in various studies (1,2). Young adults, often in a transitional life stage, may engage in patterns of alcohol consumption that differ significantly from other age groups, posing unique health risks (3,4).

Recent data suggest a growing trend of alcohol consumption among young adults, with varying patterns of drinking behavior observed across different cultures and socioeconomic backgrounds (5,6). These patterns range from moderate, social drinking to heavy and binge drinking. The impact of these differing patterns on liver function is not fully understood, particularly in the context of young adult health.

Liver function tests (LFTs) are commonly used to assess the impact of alcohol on liver health. Alterations in LFTs can indicate liver damage or dysfunction, often linked to alcohol-related liver disease (ALD) (7,8). However, the correlation between the extent of alcohol consumption and the degree of liver impairment, especially in the young adult population, remains a subject of ongoing research.

Aim: To investigate the relationship between alcohol consumption patterns and liver function in young adults.

Objectives

1. To identify and categorize the various patterns of alcohol consumption among young adults.
2. To assess liver function in this demographic using standard biochemical liver function tests.
3. To analyze the correlation between different alcohol consumption patterns and liver function test results in young adults.

Material and Methodology

Source of Data: Data for this study were collected from a combination of self-reported questionnaires and medical records of young adults attending a large urban healthcare center. This center was chosen due to its diverse patient demographic and its comprehensive medical facilities, which include advanced liver function testing capabilities.

Study Design: The research utilized a cross-sectional study design. This design was chosen as it allowed for the analysis of data from a population at a single point in time, which was suitable for assessing the current alcohol consumption patterns and their correlation with liver function among young adults.

Sample Size: The study included a total of 200 participants. This sample size was determined based on the expected prevalence of varying alcohol consumption habits in the young adult population and the statistical power required to detect significant differences in liver function test results.

Inclusion Criteria

1. Age between 18 and 30 years.
2. Willingness to participate in the study and provide informed consent.
3. Regular visits to the healthcare center for any reason, ensuring accessibility for follow-up and data collection.

Exclusion Criteria

1. Individuals with a history of chronic liver diseases unrelated to alcohol consumption - hepatitis B, hepatitis C.
2. Participants on medications known to affect liver function.
3. Pregnant or breastfeeding women.
4. Individuals with severe psychiatric disorders or cognitive impairments that might interfere with their ability to provide informed consent or reliable information.

Study Methodology

- **Alcohol Consumption Assessment:** Participants were asked to complete a detailed questionnaire regarding their alcohol consumption habits, including frequency, quantity, and type of alcohol consumed.
- **Liver Function Assessment:** Liver function was assessed using standard biochemical liver function tests, including serum levels of ALT (Alanine transaminase), AST (Aspartate transaminase), ALP (Alkaline phosphatase), and bilirubin.

Statistical Methods: Data were analyzed using statistical software. Descriptive statistics were used to summarize demographic data and alcohol consumption patterns. The association between alcohol consumption and liver function test results was evaluated using regression analysis. Statistical significance was set at $p<0.05$.

Data Collection: Participants were recruited during their regular visits to the healthcare center. After obtaining informed consent, participants completed the alcohol consumption questionnaire. Liver function tests were performed as part of routine health check-ups or specifically for the study, depending on each participant's clinical situation. Data from the questionnaires and medical tests were anonymized and securely stored for analysis.

Observation and Results

Table 1: Correlation and Odds Ratios of Liver Function Alteration Across Different Alcohol Consumption Categories in Young Adults

Alcohol Consumption Category	n (%) of Participants	Correlation (r)	Odds Ratio (OR)	95% Confidence Interval (95% CI)	P-value
Non-drinkers	40 (20%)	-	1 (Reference)	-	-
Occasional drinkers	50 (25%)	0.1	1.2	0.6 - 2.4	0.45
Social drinkers	60 (30%)	0.2	1.8	0.9 - 3.6	0.07
Regular drinkers	30 (15%)	0.3	2.5	1.3 - 4.8	0.02

Heavy drinkers	20 (10%)	0.4	3.2	1.6 - 6.4	0.001

Table 1, presents a detailed analysis of the relationship between alcohol consumption patterns and liver function among 200 young adults. In this table, five categories of alcohol consumption are identified: non-drinkers, occasional drinkers, social drinkers, regular drinkers, and heavy drinkers, constituting 20%, 25%, 30%, 15%, and 10% of the participants, respectively. A correlation coefficient (r) is used to measure the strength and direction of the association between alcohol consumption and liver function, with higher values indicating a stronger correlation. For instance, heavy drinkers show the highest correlation (r=0.4), suggesting a stronger association with liver function alteration compared to other groups. The Odds Ratios (OR) further quantify the risk of liver function alteration relative to non-drinkers (the reference category). The OR increases progressively from occasional drinkers (OR=1.2) to heavy drinkers (OR=3.2), indicating a higher risk of liver function alteration with more intense alcohol consumption. The 95% Confidence Intervals provide a range of uncertainty around the OR estimates, with narrower intervals suggesting more precise estimates. The P-values assess the statistical significance of the findings, with lower values indicating higher significance. Notably, heavy drinkers show a statistically significant association (P=0.001) with altered liver function.

Table 2: Prevalence and Risk Assessment of Altered Liver Function Categories in a Young Adult Population

Liver Function Category	n (%) of Participants	Odds Ratio (OR)	95% Confidence Interval (95% CI)	P-value
Normal Liver Function	120 (60%)	1 (Reference)	-	-
Mildly Altered Liver Function	50 (25%)	2.5	1.3 - 4.8	0.01
Moderately Altered Function	20 (10%)	5.0	2.6 - 9.5	0.001
Severely Altered Function	10 (5%)	10.0	5.1 - 19.6	<0.001

Table 2, focuses on the prevalence and risk assessment of different categories of liver function among the study population. The table categorizes liver function into four groups: normal, mildly altered, moderately altered, and severely altered, encompassing 60%, 25%, 10%, and 5% of the participants, respectively. The Odds Ratios (OR) in this table are calculated with normal liver function as the reference category. As the severity of liver function alteration increases, the OR also increases, suggesting a higher risk of severe liver function alteration in some participants. For example, participants with severely altered liver function have an OR of 10.0, indicating a significantly higher risk compared to those with normal liver function. The 95% Confidence Intervals again provide a range for the OR estimates, with the intervals widening as the severity of liver function alteration increases, reflecting greater variability in the estimates. The P-values indicate the statistical significance of the association between each category of liver function alteration and the reference group,

with values decreasing as the liver function alteration becomes more severe, suggesting a stronger statistical significance. For instance, the category of severely altered function shows a P-value of less than 0.001, indicating a highly significant risk compared to normal liver function.

Discussion

Table 1 reveals a progressive increase in the risk of liver function alteration with higher levels of alcohol consumption. This finding aligns with previous research indicating a dose-response relationship between alcohol intake and liver damage. For instance, studies by Morkem R *et al.*(2022)[5] have shown that even moderate alcohol consumption can lead to subtle changes in liver enzymes, which is reflected in the increased odds ratios for social and regular drinkers in this table. The significant correlation (r=0.4) and high odds ratio (OR=3.2) for heavy drinkers corroborate findings by Ismail LC *et al.*(2022)[6], who reported a strong association between heavy alcohol use and the risk of developing alcohol-related liver diseases. However, the lack of significant correlation for occasional drinkers (r=0.1, P=0.45) suggests a lower risk, which supports the argument by Zou J *et al.*(2022)[7] that infrequent alcohol consumption might not substantially impact liver health.

Table 2, highlights the varying degrees of liver function alteration in young adults and its association with alcohol consumption. The increasing odds ratios with the severity of liver function alteration are consistent with findings from Davies EL *et al.*(2022)[8], who noted that liver damage is often a progressive condition, worsening with continued alcohol exposure. The high risk associated with severely altered liver function (OR=10.0, P<0.001) echoes research by Aouissi HA *et al.*(2022)[9], emphasizing the grave consequences of prolonged heavy drinking on liver health. The prevalence of mildly altered liver function (25% of participants) might reflect early-stage liver damage, which has been a focus in studies like those by Tang Y *et al.*(2022)[10], indicating that early intervention in such stages is crucial for preventing further liver damage.

Conclusion

The study provides critical insights into the relationship between various alcohol consumption habits and liver function in the young adult population. The findings indicate a clear and progressive association between the intensity of alcohol consumption and the risk of liver function alteration. Heavy and regular drinkers were found to have a significantly higher risk of altered liver function compared to occasional and non-drinkers. This study underscores the importance of public health strategies and educational campaigns targeted at young adults to raise awareness about the risks of heavy and regular alcohol consumption. It also highlights the need for early screening and intervention strategies to identify and support individuals at risk of alcohol-related liver damage.

Limitations of Study

1. **Cross-Sectional Design:** As a cross-sectional study, it can identify associations but not establish causality. Longitudinal studies are needed to understand the causal relationship between alcohol consumption patterns and liver function over time.

2. **Self-Reported Data:** The study relies on self-reported data for alcohol consumption, which may be subject to recall bias or underreporting, especially in cases of heavy drinking.

3. **Sample Size and Diversity:** The sample size of 200 participants, while adequate, limits the ability to generalize findings to larger and more diverse populations. Additionally, the study may not have captured the full spectrum of socio-economic and cultural diversity that can influence drinking behaviors.

4. **Lack of Control for Confounding Variables:** The study might not have controlled for all potential confounding variables, such as diet, genetics, other lifestyle factors, or concurrent use of medications, which can also impact liver function.

5. **Focus on Young Adults Only:** While the study provides valuable information about young adults, its findings may not be applicable to other age groups who may have different alcohol consumption patterns and risks.

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