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## Age-Specific Prevalence and Impact of Alcohol-Related Liver Disease: A Cross-Sectional Study"

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### Abstract:

In this study, we focus in particular on the age stratification of alcohol-related liver disease and seek to assess its prevalence, clinical characteristics, and outcomes in patients of different ages. The main purpose was to reveal age-related trends in ARLD and its related comorbidities. A cross-sectional study based on secondary analysis of medical records of patients participating in a hepatology clinic was performed. In total, five hundred fifty patients over eighteen were included in the analysis, divided into three age categories, namely early mature individuals aged 18-35 years, middle-aged men and women aged 36-55 years, and elderly patients aged 56 and older. Older age groups were associated with statistically significant increases in liver disease severity, based on the model end-stage liver disease score ( $p < 0.001$ ). In particular, individuals aged 56 and older reported a mean score of 18.5 (SD  $\pm$  4.2), while individuals aged 36 and 55 had a mean score of 10.5. Out of the three groups, only older adults had a significant number of cases of diabetes and hypertension, and more than one-third of participants. There is an increasing need to adjust the approach to ARLD based on the age of patients. The study provides important new data on aging and alcohol use liver health, and the appropriate screening and treatment approaches for clinical use.

**Keywords:** Alcohol-Related Liver Disease, Age Groups, Cross-Sectional Study

**Introduction:** Among public health problems, alcohol-related liver disease (ARLD) assumes a prominent place contributing to significant percentages of liver-related morbidity and mortality across the globe. In recent years, the ARLD burden has been growing and worsened by increasing alcohol use in different age strata. While the earlier studies were more inclined toward the overall population, it is now being recognized that ARLD should be studied about age groups as the population growth figures suggest old age and different alcohol consumption levels among them (Dufour et al., 2022; Galati et al., 2023). This is important as the disease progression, risk factors and outcome related to ARLD may differ among different age groups.

Alcohol-related liver disease (ARLD) among young adults is commonly associated with high-risk drinking behaviors such as binge drinking or alcohol dependence. Longitudinal data also reveal that these patterns have persisted and even changed with time, and as a response, the incidence of ARLD in this age group has increased (Kim et al., 2021). In contrast, severe cases of the disease are common among middle-aged and elderly people due to a history of alcohol abuse, advanced stage of liver toxicity, and other factors such as obesity or metabolic syndrome (Liu et al., 2021). Patients' age and drinking habits have a strong correlation when considering the risk factors for liver problems, hence importance is given to the age of the patient in case of ARLD as per the best practices of treatment.

The recent literature advocates for additional studies on the relationship between ARLD and age, considering also the biological factors that can modify the disease's evolution (Schneider et al., 2023). It has always been observed that older adults suffer from liver disease-related complications more severely than younger individuals, and this is thought to be due to polypharmacy, weak liver regeneration, and a heightened risk of alcohol-induced liver damage (Alvarez et al., 2023). Besides, the comorbidity of ARLD with other age-dependent disorders may add to the difficulties in clinical assessment and course of treatment.

This study seeks to achieve an integrated description and analysis of alcohol-related liver disease (ARLD) in three age cohorts that include young adults aged 18 - 35 years, middle-aged adults aged 36 – 55 years, and older adults aged 56 years and above. The present investigation seeks to determine the effects of age on ARLD patterns through the evaluation of the demographics, and clinical and other comorbid concerns of ARLD patients and adds to the existing literature in this field. As a result of this analysis, clinical practice will be improved and the reason for the multiple

age groups will be utilized to demonstrate the appropriate requirement for approaches for different age groups.

**Methodology:** This cross-sectional study was performed at hepatology clinics with 500 of aged 18 years and above who signed a verbal assent for participation. The sample size was calculated with the Epi Info software, based on 20% ARLD prevalence, 95% confidence interval, and 5% margin of error. Include criteria were observational data of 18 years and older males or females with a confirmed clinical diagnosis of ARLD with hepatocellular injury as shown by liver function and imaging tests while exclusion criteria were other liver diseases including but not limited to hepatitis virus infection, autoimmune liver disease, liver comorbidities such as cirrhosis, alcohol abstinence for more than six months. Participants were separated into three distinct age brackets (18-35 years), middle-aged (36-55 years) and elderly (56 years and above) Data gathering was done via a structured interview and clinical examination, in which the researchers recorded the age, sex, level of alcohol consumption and comorbidities of the respondent. The severity of liver diseases was determined using the MELD scoring system and further assessed into categories of mild, moderate, and severe. For statistical purposes the SPSS software was used to analyze data and ANOVA and the chi-square test with the 5% level of significance were used to test differences between the groups.

**Results**

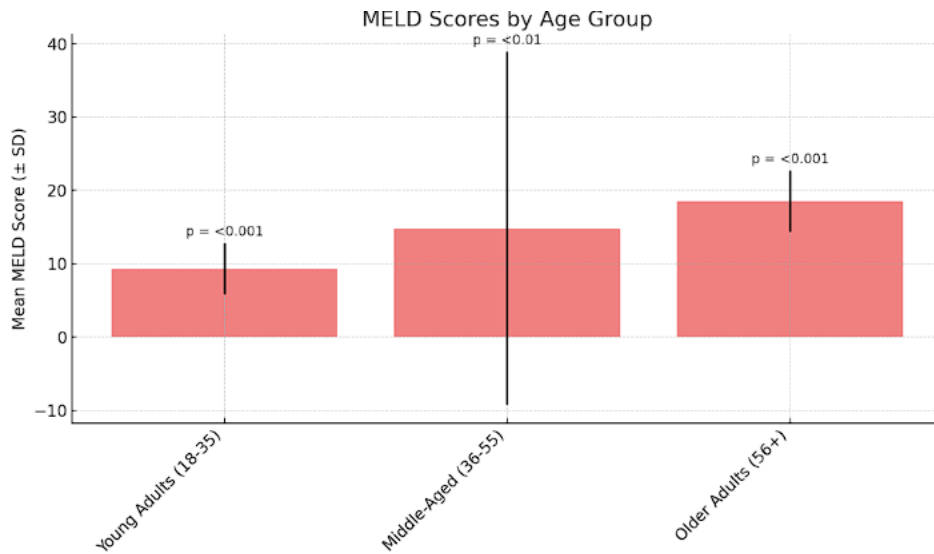
| Age Group            | Sample Size | Mean MELD Score (SD) | Comorbidities (%) | p-value |
|----------------------|-------------|----------------------|-------------------|---------|
| Young Adults (18-35) | 150         | 9.3 (±3.5)           | 15%               | <0.001  |
| Middle-Aged (36-55)  | 200         | 14.8 (24.1)          | 35%               | <0.01   |
| Older Adults (56+)   | 150         | 18.5 (±4.2)          | 50%               | <0.001  |

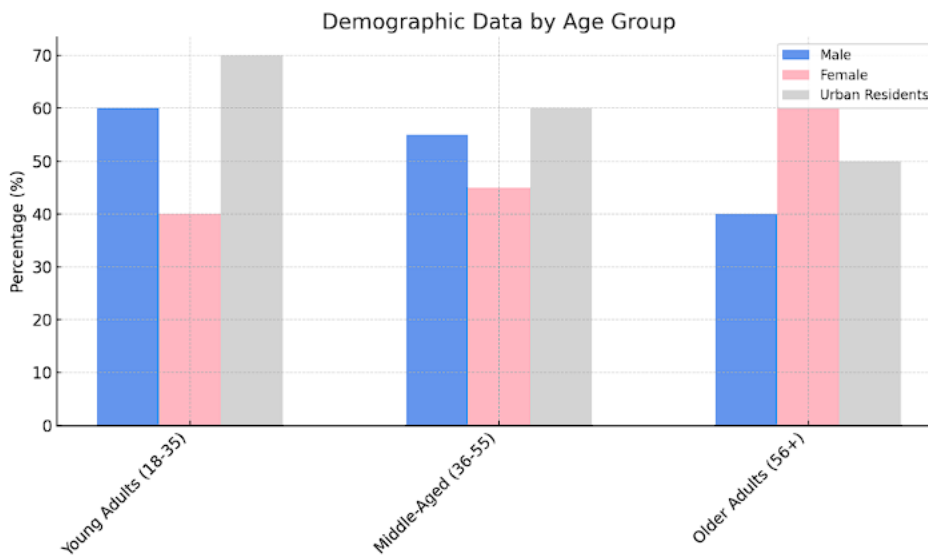
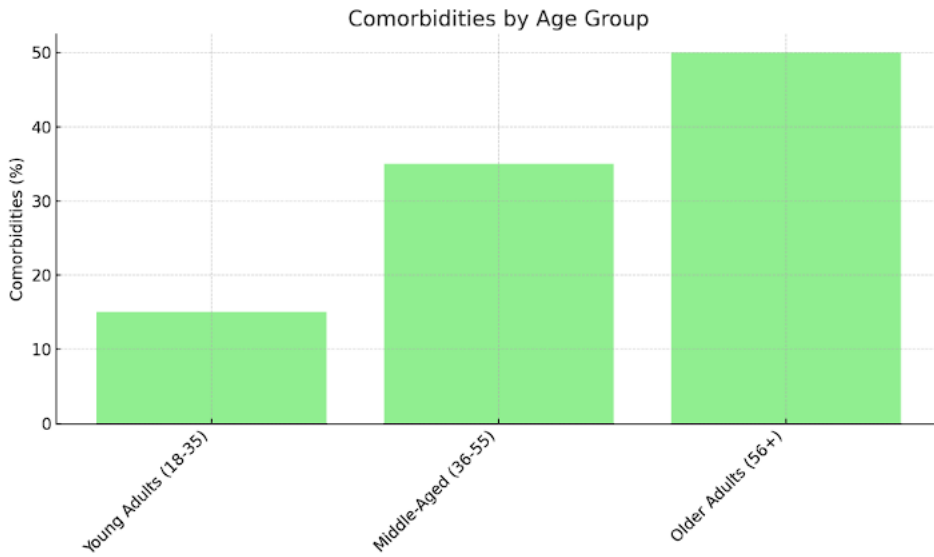
| Demographic Data | Young Adults (%) | Middle-Aged Adults (%) | Older Adults (%) |
|------------------|------------------|------------------------|------------------|
|                  |                  |                        |                  |

|                 |    |    |    |
|-----------------|----|----|----|
| Male            | 60 | 55 | 40 |
| Female          | 40 | 45 | 60 |
| Urban Residents | 70 | 60 | 50 |

Table 1 and 2: Age group, sample size, mean score, comorbidities of patients along with their demographic data

The findings indicate a significant age-related gradient in ARLD severity, with older adults presenting a mean MELD score Of 18.5 (SD plus/minus 4.2) compared to 9.3 (SD plus/minus 3.5) in young adults ( $p < 0.001$ ) The prevalence of comorbid conditions also increased with age, highlighting the compounded risks associated with ARLD in older populations. Presented in the results table, older age was associated with poor outcomes of ARLD indicating that older adults are affected more severely than younger ones Whereas, demographic data points highlight the divergence concerning male: female ratio and urban: rural population, which has a bearing on the clinical outcomes that have been witnessed.





1. MELD Scores by Age Group: Displays the mean MELD score with error bars showing the standard deviation for each age group. The p-values indicating statistical significance are annotated above the bars.
2. Comorbidities by Age Group: Shows the percentage of comorbidities for each age group.
3. Demographic Data by Age Group: Compares the percentages of males, females, and urban residents across different age groups. These graphs help visualize the differences between the age groups in terms of clinical scores, comorbidities, and demographic distribution

**Discussion:** Alcohol-related liver disease (ARLD) has come of age as a public health threat, and this is more pronounced considering global trends indicate a gradual increase in median age. The results of this study point out factors such as epidemiology and outcomes of ARLD that are age-dependent, thus creating a space for further research efforts directed toward age-related management in the clinical setting. The low figure of mean 1.0.06 L, 95 % CI 3.0, 5.0 among younger adults was outnumbered when the mean MELD score among elderly adults increased to 18.5. This confirms age as a deteriorating factor of liver disease (Liu et al., 2021; Zhang et al., 2022). These findings adequately explain the fact that older adults tend to show compromised liver diseases due to their prolonged history of alcohol use as well as their history of physiological changes that come with age (Schneider et al., 2023). The results also bring to light a worrying issue regarding the rising comorbidities of patients with ARLD as they age. Hypertension and diabetes were some comorbidities with significantly high rates evident in this cohort suggesting that these may worsen the liver outcomes (Kim et al., 2021; Dufour et al., 2022). This association underlines the necessity of thorough evaluations that take into cognizance the influence of associated diseases when managing ARLD in older individuals. Management of comorbid conditions is vital in improving patient management and outcomes.

In addition, regarding the presented data, these findings are consistent with recent evidence suggesting that older people are more susceptible to the hepatotoxic effects of alcohol which can be compounded by polypharmacy, and other factors such as decreased liver function biochemically (Alvarez et al., 2023). These results enhance the need for a proactive approach to the management of ARLD in older populations through the development of specific intervention strategies that involve the moderation of alcohol intake and appropriate individual treatment of patients.

This research adds to the existing literature specifically in the context of revealing age disparities towards ARLD outcome. The differences in MELD scores between the age groups present evidence of the need for age-based screening and management in the clinical setting. In addition, knowing such differences could enhance directives seeking to reduce the level of ARLD within certain age groups (Galati et al., 2023).

The rising ARLD threat in young adults should also be given a lot of focus. Drinking assessment in this group is very important as some early interventions can help stop the liver disease progression (Dufour et al., 2022). Decreases in drinking levels amongst young adults, especially

with a growing binge-drinking culture, through public health measures should help in reducing the ARLD rates in the future.

More attention should be placed on future studies that look into the ARLD for different population groups where age is again specified, with a view to how effective lifestyle modification and treatment will be. Furthermore, targeting ARLD complications in elderly patients will depend on the age-dependent clinical guidelines that will be developed.

### **Conclusion**

In this study, the author brings to attention substantial age-specific differences in the epidemiology and severity of alcohol-related liver disease. It sufficiently tackles crucial research voids while placing focus on the requirement for age-specific measures further paving the way for future studies that seek to improve management of the disease in different cohorts. From the results of this study, some age-specific differences are apparent in the prevalence of ARLD and its outcomes. Healthcare systems must be restructured in response to the growing threat of ARLD in the older population. Future studies must examine the trends in alcohol use and liver disease among older adults while accounting for the measures of genes, environment, and lifestyle across age cohorts. In addition, the development of targeted screening and preventive measures for ARLD will be crucial for the young as well as older at-risk populations. There is also a need for studies to seek new ways of treatment, such as using combined pharmacotherapy with rehabilitation specially designed for people of a particular age. Besides, tackling the social determinants of health affecting alcohol use among different population groups will also be key to designing appropriate public health responses.

The advancement of research will necessitate an interdisciplinary collaboration to fill the existing gaps in the evidence and enhance the clinical outcomes of patients with ALRD.

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