Original Article

Age at Onset of Alcohol Use and Alcohol Use Disorder: Time-trend Study in Patients Seeking De-addiction Services in Kerala

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ABSTRACT

Background: Declining age at onset of alcohol consumption over years has been one of the alarming findings in the epidemiology of alcoholism. The study was done to examine whether there was a decline in the age at onset of alcohol use and use disorder in subjects categorized as birth cohorts over the last 60 years seeking de-addiction services from a teaching hospital. **Materials and Methods:** A time-trend study, based on data collected from records, was done among 700 randomly selected subjects seeking de-addiction services. The study was done in a Government Medical College. Besides birth year, family history of alcohol use disorder and psychiatric comorbidity were the main independent variables studied. Trend was tested by linear regression. **Results:** There was a significant linear decline in the age at onset of alcohol use and use disorder. The mean age at onset of alcohol use and alcohol use disorder declined from 24 to 17 years and 46 to 21 years, respectively, from the pre-1950 birth cohort to the post-1985 birth cohort. Surprisingly, there was a plateau for mean age at onset of alcohol use during 1960s. The trend was significant even after adjusting for variables related to age at onset of alcohol consumption. **Conclusions:** The trend of decreasing age at onset of alcohol use and alcohol use disorder over time has policy implications. Further studies are needed for exploring mediating or causal factors for the decline in the age at onset of alcohol use and use disorder.

Key words: *Age at onset, alcohol use, alcohol use disorder, time-trend*

INTRODUCTION

Alcohol is a psychoactive substance with dependence potential and it has been widely used in many cultures for centuries. Harmful use of alcohol is the third leading risk factor for disease, disability, and death throughout the world.[1] Children, adolescents, and elderly people are typically more vulnerable to alcohol-related harm from a given quantity of alcohol than other age groups.[2-4] Over the years, consumption of alcohol has increased worldwide, and in India, the per capita consumption of alcohol has increased by a whopping 55% during the period of 1992–2012.[5]

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Early onset of alcohol use and alcohol use disorder is associated with a family history of alcohol use disorder,[6] aggression and problems with law,[7] social role maladaptation and loss of behavioral control when drinking,[8] childhood criminality,[9] and tobacco use,[10,11] thus substantiating the claim that this may be a distinctive subtype of alcoholism.

The most alarming trend is that people are beginning to drink at increasingly younger ages over the last few decades. The average age of initiation of alcohol use has reduced from 28 years during the 1980s to 17 years in 2007.[12] The percentage of the drinking population aged <21 years has increased from 2% to more than 14% in the past 15 years, according to a study conducted in Kerala.[13] Early (aged 12–14) to late (aged 15–17) adolescence is generally regarded as a critical risk period for the initiation of alcohol use, with multiple studies showing associations between age at first alcohol use and the occurrence of alcohol abuse or dependence.[14]

It is in this context that the study was done to see whether there is a trend of declining age at onset of alcohol use and alcohol use disorder in a sample of patients seeking de-addiction services in a Government Medical College.

MATERIALS AND METHODS

A retrospective time-trend study, based on data collected from records, was done among 700 patients seeking de-addiction services in a Government Medical College, Thiruvanathapuram, Kerala. Subjects were diagnosed by a qualified psychiatrist as having alcohol use disorder (both the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM^{TR}) diagnoses of alcohol dependence and abuse and DSM 5 diagnosis of alcohol use disorder) at the time of registration. Data of 50 patients per year were systematically drawn from the de-addiction registry from the year 2002 to 2015. The sample was drawn at different periods in a year to ensure that seasonal variations are minimized and a representative sample was obtained. From the selected records, age of the patient, year of registration, age of onset of alcohol use, and age of onset of dependence were entered into a pro forma designed for the study. Other variables such as occupation, level of completed education, tobacco use, other substance use, presence of serious medical illness, family history of alcohol use, and Axis 1 and Axis 2 diagnosis of the patient were also collected and entered into the pro forma. The study protocol was approved by the Human Ethics Committee of the institution.

Statistical analysis

Birth cohorts were constructed based on the age of the subjects at the time of registration and the year of registration. Year of registration minus age of the subject at the time of registration gave the birth year of individual subjects. Line graphs displaying the means of age at onset and dependence across different age cohorts were constructed.

The relationships of age at alcohol use and alcohol use disorder (A) with birth years (B) were assumed to be linear. The model used to describe the data was as follows:

$$Aj = a + bBj + e$$

Where Aj, a, b, Bj, and e were j^{th} observation of age, the intercept, slope, j^{th} observation of birth cohort, and error term, respectively. A null hypothesis that b = 0 was tested. *T*-value was the test statistic. Influence of other study variables on this linear relationship was also examined by linear regression.

The data spanned for 70 years, and considering the degrees of freedom and rule of thumb, a sample size of 700 was considered appropriate for the study.

RGui, graphic interface of R version 3.1.1 by the R foundation of statistical computing, a free software was used for analysis.

RESULTS

Background characteristics are shown in Table 1. The mean ages at onset of alcohol use and dependence were 20.86 ± 5.7 and 34.05 ± 9.3, respectively. The birth year of the subjects ranged from 1932 to 1996. Subjects before 1950 were less as also those born above 1985.

Figure 1 shows the distribution of mean ages of onset across different 5-year birth cohorts, which shows clearly a significant linear trend. In the birth cohort before 1950, mean age at onset of alcohol use was 24 years whereas in the above 1985 cohort, it was 17 years. Interestingly, there was a plateau in the age at onset in 1960s.

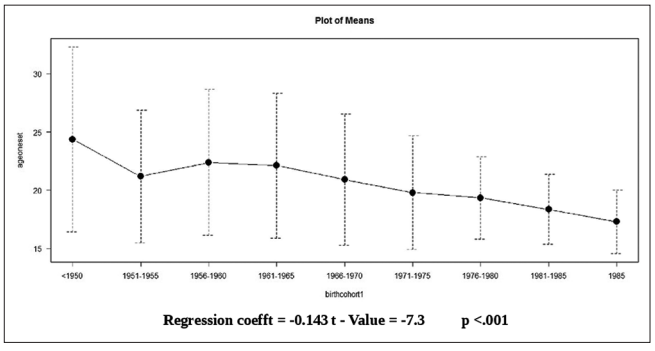

Figure 1: The time trend of age at onset across birth cohorts

Figure 2 shows the declining time trend in the mean ages at onset of alcohol use disorder across birth cohorts. This was statistically significant. Age at onset of dependence-trend is steeper than age at onset of alcohol use trend. Before 1950, mean age at onset of dependence was 46 years before 1950, but after 1985, it has become 21 years of age.

Table 2 shows the results of multiple linear regressions in which factors other than cohort effect were also examined to see whether they are related to decreased age at onset for alcohol use and alcohol use disorder. The linear relation of birth cohorts with age at onset of alcohol use and use disorder is maintained after adjusting for other variables and there was no change in regression coefficient. Only other variable found to be related to age at onset of alcohol use was use of other substances. Factors significantly related to age at dependence were Axis 1 psychiatric morbidity and tobacco dependence.

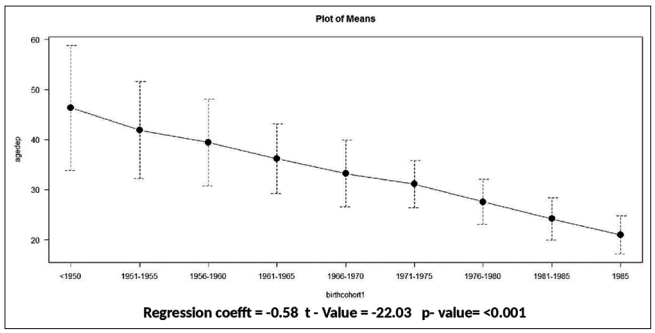

Figure 2: The time trend of age at dependence across birth cohorts

Table 1: Background characteristics of the sample

	n	Mean/number	SD/percentage
Age at registration	700	41.39	9.98
Age at onset of alcohol use	698	20.86	9.28
Age at dependence	675	34.05	5.67
Marital status			
Unmarried	700	90	12.9
Married		610	87.1
Educational status			
Illiterate	700	7	1
Primary		119	17
Upper primary		168	24
High school		287	41
Higher secondary		56	8
Graduate		35	5
Postgraduate/professional		28	4
Employment status			
Unemployed	700	27	3.9
Unskilled		321	45.9
Skilled professional		251	35.9
Professional		95	13.6
Student		6	0.9
Tobacco dependence	700	501	71.6
Other substance use	700	41	5.9
Family issues	700	546	78.1
Axis 1 disorder			
Mood disorder	697	174	25
Psychotic disorder		61	8.8
Anxiety disorder		9	1.1
Axis 2 comorbidity			
Cluster A	700	7	1.0
Cluster B		74	10.6
Cluster C		9	1.3

SD – Standard deviation

DISCUSSION

This time-trend study, in principle a longitudinal study, but based on the charts of 700 patients treated for their alcohol use disorder over 13 years in a de-addiction center, attached to a Government Medical College had shown a significant linear trend in the decline of age at onset of alcohol use and alcohol use disorder. The mean age at onset after 1985 cohort was 17 years. This was comparable to the Global Burden of Disease Study in 2010, which showed a decline in the average age of initiation of alcohol use from 28 in 1980s to 17 in 2007, in terms of absolute time periods.[15] The changing social norms and growing acceptability of alcohol, increased accessibility and availability, and continuous growth in disposable income (per capita income) might have contributed to the declining trend in the age of initiation and alcohol dependence.[16] A younger age of alcohol initiation was strongly related to a higher level of alcohol misuse at the age of 17–18,[15] although this transition is mediated by the effects of parent drinking, proactive parenting, peer alcohol initiation, and ethnicity.[17] However, there

Table 2: Multivariate analysis results

	Regression coefficient	CI	*P*
Age at onset			
Constant	310.29	217.67-402.92	0.00
Marital status	0.46	−1.02-1.94	0.54
Occupational status	0.33	−0.30-0.95	0.29
Tobacco dependence	−0.56	−1.53-0.41	0.26
Other substance use	−1.85	−3.73-0.01	0.05
Axis 1 psychiatric disorder	0.18	−0.45-0.80	0.57
Axis 2 psychiatric disorder	−0.28	−0.92-0.35	0.38
Educational status	0.11	−0.30-0.52	0.59
Cohort	−0.15	−0.20-−0.10	0.00
Age at dependence			
Constant	1160.585	1039.99-1281.18	0.00
Marital status	0.45	−1.50-2.38	0.65
Occupational status	0.26	−0.54-1.06	0.53
Tobacco dependence	−1.51	−2.78-−0.25	0.02
Other substance use	−2.03	−4.49-0.42	0.10
Axis 1 psychiatric disorder	−1.15	−1.96-−0.33	0.01
Axis 2 psychiatric disorder	−0.27	−1.10-0.60	0.53
Educational status	0.28	−0.25-0.81	0.29
Cohort	−0.57	−0.63-−0.51	0.00

CI – Confidence interval

are arguments that rather than being a causal factor, early age at onset is a marker of alcohol dependence.[18] The current study had also demonstrated parallels between time-trends of the age at onset and age at dependence.[17]

The linear relationship between birth cohorts and mean age at onset of alcohol use and alcohol use disorder was independent of the other variables. Only other variable which was nearly related to age at onset of alcohol use was use of other substances. Tobacco dependence and Axis 1 psychiatric disorder were the variables which had an independent and statistically significant relation with age at onset of dependence. Hence, It is likely that these variables are the mediating factors and not casual factors for the declining trend in the age at onset of alcohol use and alcohol use disorder. Hence, other factors such as social, demographic, political, and biological need to be explored.

The major limitation of this study is that it is retrospective in nature. Drinking histories are elicited years after its first use. The longer the time interval between initiating drinking and reporting on it, the greater are the scope for recall problems and telescoping forward so as to report a later age of first drinking.[19] However, it was also noted that retrospective recall of age of onset of alcohol and drug use had shown a fair degree of agreement.[20] A group of the subjects who were born earlier might have been missed due to mortality or migration leading to attrition bias and thus might have affected the outcome of the study. The profile is of a group seeking care. So, how far the results can be generalized to general population alcohol users remains uncertain.

CONCLUSIONS

Harmful use of alcohol is a global problem which comprises individual, social, and economic implications. Drinking pattern is changing in India. In spite of its limitations, with a large sample size, the present study has found out that there has been a declining trend in the age at onset of alcohol use and dependence. Early onset of alcohol consumption has a significant impact on onset, course, and outcome of alcohol use disorder. One of the major problems faced in framing a comprehensive national policy is that there is not enough research done in this area in India. The mediating or causal factors for the declining age at onset and age at dependence such as social, biological, political, and demographic need investigation for a better understanding and forms a future research agenda.

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Conflicts of interest
There are no conflicts of interest.

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