Changes in Alcohol Consumption Among a Population Who Underwent Medical Checkups During the First Wave of the Coronavirus Disease 2019 Pandemic in Japan: A Single-Center Retrospective Study

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ABSTRACT

Background: *Movement restrictions during the coronavirus disease 2019 (COVID-19) pandemic have inflicted stress and affected drinking behavior. However, limited information is available on the changes in alcohol use among the Japanese population.*

Method: *This retrospective study included 371 subjects aged 20–74 years who underwent medical checkups at Fuyoukai Murakami Hospital before (April 1, 2019 to December 31, 2019) and during the COVID-19 pandemic (April 1, 2020 to May 31, 2020). All data were extracted from medical records. Changes in alcohol consumption and severity were also investigated. A logistic regression model was used to identify the risk factors associated with increased drinking, and seven variables were sequentially introduced into the model—age (≤ 49 years), male sex, prior instructions for alcohol restriction, medication for lifestyle-related diseases (e.g., hypertension, dyslipidemia, type 2 diabetes mellitus, and hyperuricemia), depression or insomnia, essential workers, and smoking.*

Results: *The median age was 46 years, and 81.7% subjects were men. In total, 25.1% subjects increased their alcohol intake, and 24.5% subjects reduced their alcohol intake. The rates of excessive alcohol consumption (≥ 60 g ethanol per day) were 15.9% and 16.7% in the pre-COVID-19 period and during the COVID-19 pandemic, respectively. Multivariate analysis identified only age ≤ 49 years as a risk factor for increased drinking (adjusted odds ratio, 2.20; 95% CI: 1.22–3.99; p = 0.009).*

Conclusion: *Approximately one-fourth of the subjects reported increased drinking, although the overall severity remained stable. The importance of alcohol reduction, particularly among young people, should be emphasized.*

Keywords: *alcohol intake, COVID-19, drinking behavior, movement restriction, pandemic*

ABSTRAK

Latar belakang: *Pembatasan sosial selama pandemi coronavirus disease 2019 (COVID-19) telah menimbulkan stress psikologis dan memengaruhi perilaku konumsi alkohol. Namun, belum banyak informasi mengenai perubahan konsumsi alkohol pada populasi di Jepang.*

Metode: *Studi retrospektif ini mengikutsertakan 371 subjek berusia 20-74 tahun yang menjalani pemeriksaan kesehatan rutin di Rumah Sakit Fuyoukai Murakami sebelum (1 April 2019 sampai 31 Desember 2019) dan*

selama (1 April 2020 sampai 31 Mei 2020) pandemi COVID-19. Seluruh data diperoleh dari rekam medis. Perubahan dan tingkat konsumsi alkohol juga dinilai. Model regresi logistik digunakan untuk mengetahui faktor risiko yang berhubungan dengan peningkatan konsumsi alkohol dengan tujuh variabel yang diikutsertakan dalam model – usia (≤ 49 tahun), jenis kelamin laki-laki, pernah diberi saran untuk restriksi alkohol, konsumsi obat-obatan untuk penyakit terkait gaya hidup (seperti hipertensi, dislipidemia, diabetes melitus tipe 2, dan hiperurisemia), depresi atau insomnia, pekerja di bidang esensial, dan merokok.

***Hasil:** Median usia adalah 46 tahun dan 81,7% adalah laki-laki. Secara keseluruhan, 25,1% subjek mengalami peningkatan konsumsi alkohol sementara 24,5% menurunkan konsumsi alkoholnya. Konsumsi alkohol berlebihan (≥ 60 g etanol tiap hari) mencapai 15,9% dan 16,7% pada periode sebelum dan selama pandemi COVID-19, secara berturut-turut. Hasil analisis multivariat menunjukkan hanya usia ≤ 49 tahun yang merupakan faktor risiko meningkatnya konsumsi alkohol (adjusted odds ratio, 2.20; 95% CI: 1.22–3.99; p = 0.009).*

***Simpulan:** Sekitar satu perempat dari subjek melaporkan peningkatan konsumsi alkohol, meskipun tingkatan konsumsi cenderung sama. Pentingnya mengurangi konsumsi alkohol, terutama pada populasi muda, perlu lebih ditekankan lagi.*

***Kata kunci:** COVID-19, kebiasaan minum, konsumsi alkohol, pandemi, pembatasan sosial*

INTRODUCTION

In December 2019, an outbreak of pneumonia caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in Wuhan, China. SARS-CoV-2 has rapidly spread across China and worldwide. The World Health Organization (WHO) has named this new disease coronavirus disease 2019 (COVID-19) and declared its outbreak as a pandemic on March 11, 2020. Since the number of COVID-19 cases increasing rapidly in Japan, the Japanese government declared a state of emergency for seven prefectures on April 7, 2020, which was extended to all 47 prefectures on April 16, 2020. The state of emergency included self-restraint requests, closure of public places, and cancelation of public gatherings. Subsequently, due to the decreased number of newly diagnosed COVID-19 cases, the Japanese government lifted the state of emergency on May 25, 2020.

Movement restrictions during the COVID-19 pandemic have inflicted stress and affected drinking behavior.[1-3] However, limited information is available on the changes in alcohol use among the Japanese population. Therefore, the present study investigated changes in alcohol consumption during the first wave of the COVID-19 pandemic in Japan.

METHOD

This retrospective study included 371 subjects aged ≥ 20 years who underwent medical checkups at Fuyoukai Murakami Hospital, Aomori city, Japan before (from April 1, 2019 to December 31, 2019) and during the COVID-19 pandemic (from April 1, 2020 to May 31, 2020). The following characteristics extracted from medical records were analyzed: age, sex, drinking behavior, instruction for alcohol restriction, medication for lifestyle-related diseases (e.g., hypertension, dyslipidemia, type 2 diabetes mellitus, and hyperuricemia), mental illness, occupation, and tobacco habit. The subjects were asked how much and how often they drink. Changes in alcohol consumption (grams of ethanol per day) were investigated and divided into three categories—increased drinking, no change, and decreased drinking. In addition, changes in the alcohol consumption patterns were assessed.

A logistic regression model was used to identify the risk factors associated with increased drinking, and seven variables were sequentially introduced into the model—age (≤ 49 years), male sex, prior instructions for alcohol restriction, medication for lifestyle-related diseases, depression or insomnia, essential workers, and smoking. Among the subjects who increased their alcohol intake, changes in liver function tests, including serum aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma-glutamyl transpeptidase (GGT) levels, were investigated. Statistical analysis was performed using EZR (easy R, version 1.54), and $p < 0.05$ was considered statistically significant.[4] UMIN-CTR issued approval UMIN000044486. The Institutional Ethics Committee of Fuyoukai Murakami Hospital approved this study, and informed consent was obtained from the subjects.

RESULTS

The characteristics of the study participants are summarized in Table 1. The median age of the subjects was 46 years (range, 20–74 years), and 81.7% (303/371) subjects were men. In total, 25.1% (93/371) subjects increased their alcohol intake, while 24.5% (91/371) subjects reduced their alcohol intake (Figure 1). No remarkable changes in patterns of alcohol consumption were found between the pre-COVID-19 and COVID-19 pandemic periods (Figure 2). Multivariate analysis identified only age ≤ 49 years as a risk factor for increased drinking (adjusted odds ratio, 2.20; 95% CI: 1.22–3.99; p = 0.009; Table 2). Serum GGT levels was significantly elevated in the subjects who increased their alcohol intake (p = 0.006; Table 3).

Table 1. Characteristics of the study subjects (n = 371)

Age (years), median (25%, 75%)	46 (38, 58)
Male, n (%)	303 (81.7)
Prior instruction for alcohol restriction, n (%)	81 (21.8)
Medication for lifestyle-related diseases*, n (%)	105 (28.3)
Mental illness, n (%)	5 (1.3)
Depression, n (%)	1 (0.3)
Insomnia, n (%)	4 (1.1)
Essential workers, n (%)	56 (15.1)
Smoking, n (%)	174 (46.9)

*, hypertension, dyslipidemia, type 2 diabetes mellitus, and hyperuricemia

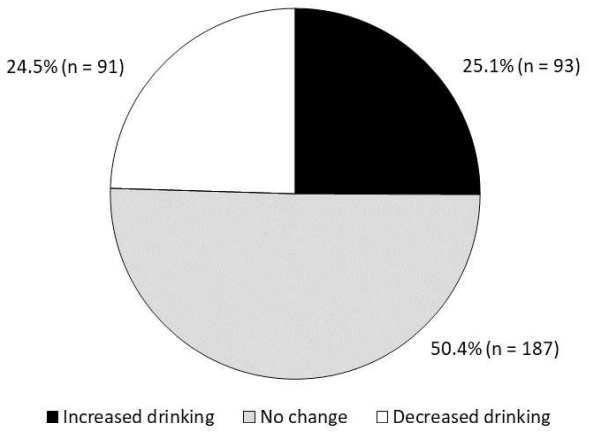

Figure 1. Changes in amount of alcohol consumption

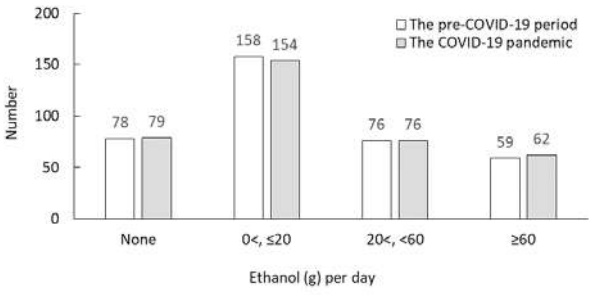

Figure 2. Changes in patterns of alcohol consumption

Table 2. Results of multivariate analysis for identifying the risk factors contributing to increased alcohol consumption

Variables	Crude OR (95% CI)	p	Adjusted OR (95% CI)	p
Age ≤ 49 years	1.82 (1.11–2.98)	0.02	2.20 (1.22–3.99)	0.009
Male	1.52 (0.79–2.93)	0.21	1.36 (0.63–2.95)	0.44
Prior instruction for alcohol restriction	1.25 (0.72–2.17)	0.44	1.37 (0.76–2.47)	0.30
Medication for lifestyle-related diseases*	0.91 (0.54–1.54)	0.73	1.29 (0.68–2.43)	0.44
Depression or insomnia	0.75 (0.08–6.75)	0.79	0.99 (0.10–9.65)	0.99
Essential workers	0.70 (0.34–1.41)	0.31	0.87 (0.39–1.95)	0.74
Smoking	1.02 (0.64–1.64)	0.93	0.85 (0.51–1.41)	0.53

OR, odds ratio; CI, confidence interval; *, hypertension, dyslipidemia, type 2 diabetes mellitus, and hyperuricemia

Table 3. Changes in serum AST, ALT, and GGT levels among the subjects who increased their alcohol intake

Variables	The pre-COVID-19 period	The COVID-19 pandemic	p*
Serum AST level, median (IU/L)	20	22	0.17
Serum ALT level, median (IU/L)	20	22	0.17
Serum GGT level, median (IU/L)	34.5	39	0.006

AST, aspartate aminotransferase; ALT, alanine aminotransferase; GGT, gamma-glutamyl transpeptidase; *, Wilcoxon signed rank test

Table 4. Rates of increased alcohol consumption by age

Age, years	Increased drinking, %
20–29	36.6 (15/41)
30–39	23.8 (15/63)
40–49	30.6 (33/108)
50–59	22.2 (18/81)
60–69	17.9 (12/67)
70 ≤	0 (0/11)

DISCUSSION

The present study revealed that approximately one-fourth of the subjects increased their alcohol intake, almost half of the subjects showed no change in alcohol intake, and the remaining one-fourth of the subjects decreased their alcohol intake. An international survey with data on 1346 subjects from 83 countries showed that 36% subjects reported an increase in alcohol consumption, although drinking behavior decreased overall during quarantine.[3] Additionally, country-level subsample analyses indicated that alcohol consumption increased in the UK during quarantine.[3] In a population survey of 1555 active drinkers in the UK, approximately one-fifth of the subjects increased alcohol consumption during the lockdown, whereas more than one-third of the subjects stopped drinking or reduced their alcohol intake.[1] Movement restrictions and avoiding gatherings in response to the COVID-19 pandemic can reduce alcohol consumption outside the home; however, some people may increase drinking at home. Interestingly,

24.6% Manhattan, New York, residents reported increased drinking after the September 11 terrorist attacks.[5] It is deemed that 20–30% of the population is likely to increase alcohol consumption under high stress, which is a public health problem. In the present study, the rates of excessive alcohol consumption (≥ 60 g ethanol per day) were 15.9% (59/371) and 16.7% (62/371) in the pre-COVID-19 period and during the COVID-19 pandemic, respectively (Figure 2). Although the overall severity remained stable, the fact that almost one-sixth of the subjects were excessive alcohol drinkers is a serious concern. Physicians need to identify people who tend to be addictive and apply abstinence or harm reduction strategies.

The present study demonstrated that age ≤ 49 years was independently associated with increased drinking during the COVID-19 pandemic. The rates of increased alcohol consumption by age are shown in Table 4. Subjects aged 20–29 years had the highest rate of increased alcohol consumption (36.6%; 15/41), followed by those aged 40–49 years (30.6%; 33/108) (Table 4). In several countries, including the US, the UK, Australia, Norway, Belgium, and Finland, it was reported that young people significantly increased alcohol consumption during the COVID-19 pandemic.[6-11] The possible reasons include a higher frequency of anxiety and depression associated with COVID-19, financial concerns, and greater socioeconomic pressures (e.g., childcare and rent/mortgage repayments).[6-9] Among young people, negative urgency is likely to act more impulsively. Therefore, the importance of alcohol reduction should be emphasized. Contrary to expectations, depression or insomnia and essential workers were not risk factors for increased alcohol consumption, which may be because the prevalence of mental illness was low (1.3%; 5/371) (Table 1), and there was a wide range of stress among essential workers during the COVID-19 pandemic.

Among the subjects who increased their alcohol intake, no significant changes were found in serum AST and ALT levels. This may be because changes in serum aminotransferase levels depend on the duration of increased drinking as well as the degree of alcohol consumption. Alcohol use causes substantial health loss. A systematic analysis demonstrated that the level of alcohol consumption that minimizes health loss is zero.[12] Regrettably, 17.9% (14/78) subjects started drinking in the present study.

The present study has several limitations. First, self-reported data can cause an underestimation of alcohol consumption. Second, there were demographic differences between the general population and this study population. Third, socioeconomic status, living environment (e.g., living alone, being married, and having children), and educational level, which may affect alcohol consumption, were unknown.

CONCLUSION

Approximately one-fourth of the subjects reported increased alcohol consumption, although the overall severity remained stable. The importance of alcohol reduction, particularly among young people, should be emphasized.

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