

Rapid Communication

# Complicated Alcohol Withdrawal—An Unintended Consequence of COVID-19 Lockdown

Venkata Lakshmi Narasimha<sup>id</sup>, Lekhansh Shukla\*, Diptadhi Mukherjee, Jayakrishnan Menon, Sudheendra Huddar, Udit Kumar Panda, Jayant Mahadevan, Arun Kandasamy, Prabhat K Chand, Vivek Benegal, and Pratima Murthy

Centre for Addiction Medicine, Department of Psychiatry National Institute of Mental Health and Neurosciences (NIMHANS), Hosur Road, Bengaluru, 560029, India

\*Corresponding author: Centre for Addiction Medicine, Department of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS), Hosur Road, Bengaluru 560029, India. Tel: 91-080-26995264. E-mail: drlekhansh@gmail.com

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## Abstract

**Aim:** To assess the impact of COVID-19-related lockdown in India on alcohol-dependent persons.

**Method:** We examined the change in the incidence of severe alcohol withdrawal syndrome presenting to hospitals in the city of Bangalore.

**Results:** A changepoint analysis of the time series data (between 01.01.20 to 11.04.20) showed an increase in the average number of cases from 4 to 8 per day (likelihood ratio test:  $\chi^2 = 72$ ,  $df = 2$ ,  $P < 0.001$ ).

**Conclusion:** An unintended consequence of the lockdown was serious illness in some patients with alcohol use disorders.

## INTRODUCTION

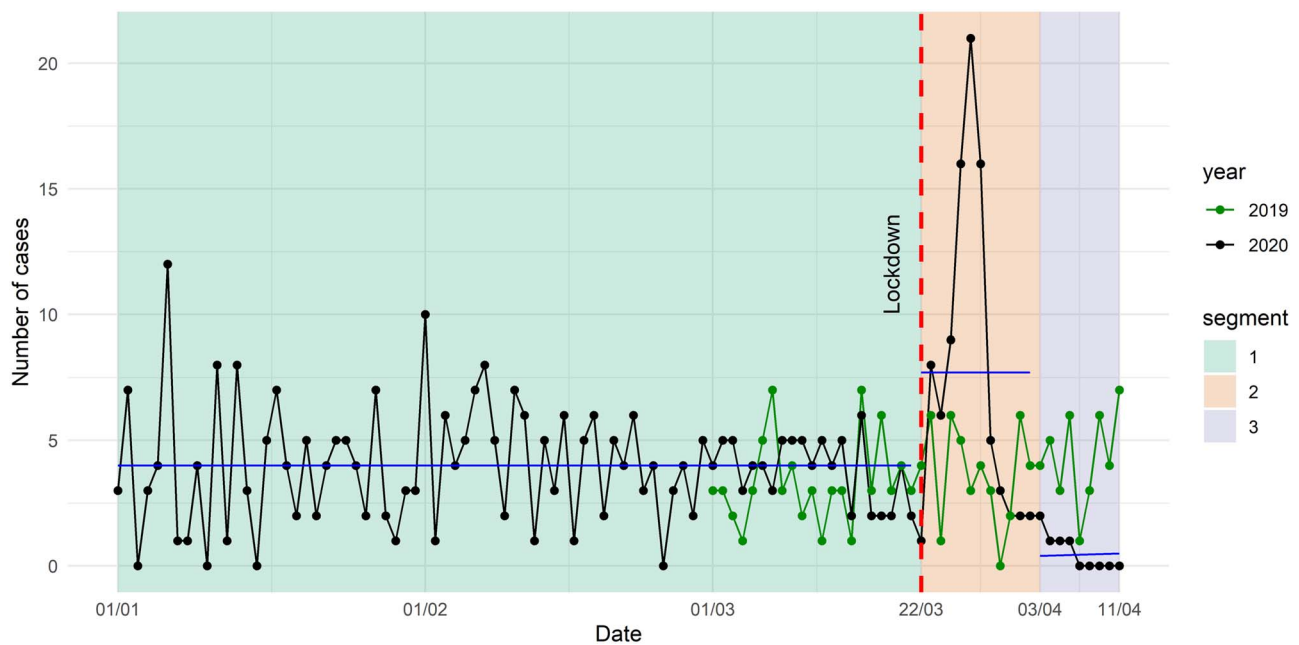
At the time of this writing, at least 1.9 million individuals in 184 out of 193 countries have suffered from coronavirus disease 2019 (COVID-19), and 0.1 million have succumbed to it (Centre for Systems Science and Engineering, 2020). In an attempt to control the spread of infection, most countries have restricted movement and curtailed business ('lockdown'), including the closure of alcohol vends (Juliana Kaplan, 2020). An unintended (but not unforeseeable) consequence of this 'dry period' could be an increase in the incidence of severe alcohol withdrawal syndrome (AWS) (Schuckit, 2014).

In India, the production, transport, sale and limit of personal possession of beverages with more than 0.5 per cent are regulated by state excise laws (Monika Arora, 2013). These laws allow the government to prohibit functioning of alcohol vends, pubs and traditional liquor outlets by issuing an order. Contravention of excise orders attracts criminal proceedings. For example, in the state of Karnataka, sale of liquor during prohibition attracts imprisonment

up to 5 years (Karnataka Excise Act, 1965). Thus, state governments can effect an alcohol ban at short notice. We have previously reported how an alcohol ban in the context of elections led to an increase in the incidence of AWS (Narasimha *et al.*, 2018).

The first COVID-19 case in India was reported on 30 January 2020. The government of India instituted a 21-day lockdown on 24 March 2020. The exempted activities include those related to food, groceries, healthcare, communication and basic amenities. Even before this, the state of Karnataka went into lockdown on the evening of 21 March 2020. During the lockdown, all states and union territories banned alcohol.

Alongside, health services have undergone two significant changes to prevent COVID-19 transmission. First, non-emergency services have been shut down (Ministry of Health and Family Welfare, 2020a). Second, patients suspected with COVID-19 are seen only in dedicated hospitals or earmarked areas of a non-dedicated hospital (Ministry of Health and Family Welfare, 2020b).



**Fig. 1.** Change in the number of severe alcohol withdrawal syndrome cases (delirium tremens, seizures and hallucinosis) seen in the emergency department following COVID-19-related lockdown. Blue solid lines show the mean number of visits in each segment during the year 2020; on the evening of 21 March 2020 (red interrupted line).

In this background, we report the changes in the incidence of severe AWS presenting to psychiatry emergency services, following non-availability of alcohol due to the COVID-19 lockdown. We specifically focus on alcohol withdrawal seizures, delirium tremens (DT) and withdrawal hallucinosis. While withdrawal hallucinosis is not considered a complicated withdrawal state, in our practice it is associated with a high risk of self-harm and progression to delirium tremens (Narasimha *et al.*, 2019).

## METHODS

Data were collected from the psychiatry emergency services of a government-funded tertiary-level hospital in Bangalore, National Institute of Mental Health and Neurosciences. Bangalore is a metropolitan city with an estimated population of 12.3 million; it is the capital of the southern state of Karnataka.

We collected the number of emergency department (ED) visits per day for alcohol withdrawal seizures (F 10.31), delirium tremens (F 10.40 and F 10.41) and alcohol withdrawal hallucinosis (F 10.52) between 01 January 2020 to 11 April 2020 (102 days) (WHO, 1992). We hypothesized that the number of ED visits for severe AWS would change following the onset of lockdown on 22 March 2020. To empirically test this hypothesis, we have used a changepoint analysis to examine the presence of distinct segments in the time series. Changepoint detection is an established method of detecting disease outbreaks (Texier *et al.*, 2016). We have used binary segmentation with a minimum segment length of 7 days to identify a maximum of five segments, the type of penalty is Bayes' information criterion (BIC), and the number of daily visits is modelled with Poisson distribution (Killick and Eckley, 2014). Analyses are done in R software with 'changepoint' package. We must note that events with low counts do not follow a normal distribution; therefore, we cannot compare the mean number of visits between pre-lockdown and post-lockdown period to draw an inference.

To rule out a 'time of the year' effect due to cultural or economic reasons, we graphically compare the number of ED visits with severe AWS between 01 March 2019 and 11 April 2019 and the corresponding dates in 2020.

## RESULTS

### Change in the number of severe AWS cases

As shown in Fig. 1, the time series (count vs date) consists of three segments with a substantial difference in the mean number of severe AWS cases per day (denoted with  $\mu$ ). Segment 1 (January 1 to March 22) shows the usual ( $\mu_1 = 4$ ) number of severe AWS cases. Following the lockdown on 22 March 2020, there is an increase in the counts ( $\mu_2 = 8$ ) which is followed by the current period where the counts are lower than usual ( $\mu_3 < 1$ ). Also, there is no corresponding peak last year, which rules out a recurring phenomenon.

The BIC of an intercept-only model ( $y \sim 1$ , family = Poisson) is 556 (df = 101) with residual deviance of 256. The BIC of a three-segment model ( $y \sim 1|segment$ , family = Poisson) is 488 (df = 99) with a residual deviance of 187. The likelihood ratio test shows that a three-segment model is significantly more likely ( $\chi^2 = 72$ , df = 2,  $P < 0.001$ ).

### Sociodemographic and clinical profile of the patients

Ninety-six, middle-aged (mean [M] = 43 and standard deviation [SD] = 9 years) male patients suffering from severe AWS have sought help between 22 March 2020 and 11 April 2020 as compared to 79 cases between 01 March 2020 and 21 March 2020. DT with or without seizures was the most common presentation ( $N = 77$ , 80%), followed by withdrawal seizures ( $N = 16$ , 17%) and withdrawal hallucinosis ( $N = 12$ , 12%). A majority of these patients ( $N = 73$ , 76%) belonged to below poverty line (i.e. were deemed in need of nutritional support and other welfare schemes by the government).

All patients reported daily heavy alcohol use ( $M = 18$ ,  $SD = 4$  standard units of alcohol).

A majority of these patients ( $N = 92$ , 95%) reported COVID-19-related lockdown as the reason for cessation of alcohol use; head injury ( $N = 2$ ) and vomiting ( $N = 2$ ) were the reason for the remaining four patients. Case notes reflect that a majority ( $N = 77$ , 80%) reported closure of alcohol vendors as the specific reason for cessation.

Importantly, most of the DT patients were very sick at the time of presentation. Three had a history of head injury, four had symptoms suggestive of Wernicke's encephalopathy, and all had signs of dehydration. Worryingly, 42% of these patients ( $N = 40$ ) had at least one of these symptoms: fever, cough, shortness of breath, vomiting or diarrhoea and sore throat or rhinitis.

## DISCUSSION

Lockdown in Karnataka commenced on 21 March 2020. We analysed the pattern of treatment-seeking for severe AWS in our ED between 01 January 2020 and 11 April 2020. Using a changepoint analysis, we could demonstrate that the pattern of severe AWS-related visits changed significantly. The first changepoint coincided with the onset of lockdown and heralded a significant increase in the number of visits. The second changepoint is on 03 April 2020, marking a decrease in severe AWS-related visits reflecting the natural course of alcohol withdrawal. Before discussing the implications of these findings, we must consider explanations unrelated to COVID-19.

We do not see a similar pattern in the month of March and April of 2019; this rules out a seasonal trend. Theoretically, if several health facilities stop functioning, there can be a displacement of caseload to the remaining facilities. However, the majority of these patients are below the poverty line, and it is unlikely that they would have chosen private hospitals in normal times. We note that 70–75% of patients seen in our outpatient, inpatient and ED come from below the poverty line. To our knowledge, EDs in all government hospitals in the city of Bangalore are functioning. Most patients reported the alcohol ban during lockdown as the reason for abrupt cessation. Travel restrictions and unavailability of routine medical care likely prevented some of these patients from seeking medical attention at an earlier stage. Informal sources of alcohol are widespread in India; the current lockdown is perhaps affecting these clandestine operations also (see Benegal, 2005). In summary, multiple effects of COVID-19 related to lockdown are the likely explanation of our findings. Media reports from other parts of the country indicate suicides (Jayakumar, 2020), liquor theft (Haider, 2020) and deaths due to consumption of toxic alcohol (G.C. Shekhar, 2020). Similar concerns have emerged from Thailand after the unavailability of alcohol during lockdown (Saengow, 2020).

COVID-19 pandemic and the measures to contain it will have profound effects on the epidemiology and the treatment gap of addictive disorders (Marsden *et al.*, 2020). Justifiably the focus of the field is on protocols for opioid substitution therapy (Ali *et al.*, 2020); we aver that severe alcohol withdrawal is an equal, if not a more pressing concern. We show that following lockdown, EDs may have to cope with twice the usual number of severe AWS cases for up to 10 days. In addition to taxing already strained ED resources, severe alcohol withdrawal, especially DT, presents many challenges.

First, consider this: a typical DT patient in Karnataka is likely to be an unemployed, probably homeless person suffering from electrolyte abnormalities, structural brain lesions, malnutrition and not in a state to provide travel or contact history (Ferguson *et al.*,

1996; Eyer *et al.*, 2011). In addition to this, vomiting, fever and tachypnoea are commonly seen in DT (Schuckit, 2014). Given this, should the patient be managed as a suspected COVID-19 patient? Depending on the availability of resources and government policies, ED teams managing severe AWS cases will face tough choices. For example, when we faced this surge, our centre did not have in-house testing, and isolation facilities were in the process of being set up. Till 20 March 2020, the government testing strategy was limited to patients with international travel history or close contact with a confirmed case. Although subsequent revisions included all patients with 'severe acute respiratory illness', percolation of this guideline and increase in testing capacity lagged for several days. We now know that random samples collected from patients with no history of international travel or close contact with COVID-19 cases were turning out positive as early as 15 February 2020 (Gupta *et al.*, 2020). We were concerned about the crowding in the ED, exposure of other patients and their attenders to patients who were coughing and febrile and safety of the doctors and nurses. As a result of these complexities, we had to discharge most of these patients within 36 hours.

Second, patients with severe AUD are at a higher risk of contracting COVID-19 as they may fail to comply with protective measures. They are also more likely to have a severe form of illness due to comorbid conditions and immunosuppressed state. Therefore, a large number of AUD cases visiting ED in these times are dangerous for patients as well as ED staff.

Third, we are concerned that these patients may fail to get treatment at all. During lockdown public transport is unavailable, health services are in flux, and professionals that do not have Personal Protective Equipment (PPE) will be reluctant to examine and treat patients with respiratory symptoms. There are reports that hospitalizations and quality of care for ST-elevation myocardial infarctions (STEMI) have decreased during COVID-19 pandemic (Tam *et al.*, 2020). AUD patients are even more likely to slip through the cracks as they tend to come from disadvantaged backgrounds and face stigma.

What are the solutions? The solutions will have to be context-specific. For example, Scottish health services disseminated information to guide patients in gauging their risk of severe AWS and planning safe domiciliary detoxification (Scottish Health Action on Alcohol Problems, 2020). This strategy may work in a higher income, well-connected population. Most of our patients reported that they wished to stockpile and gradually reduce, but they did not have the money to buy alcohol on the last day. Nevertheless, planning, foreseeing an increase in severe AWS and ensuring that addiction treatment services are not disrupted are reasonable steps in all settings.

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## CONFLICT OF INTEREST

This work has not received any funding support. None of the authors has any conflict of interest to declare.

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