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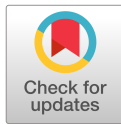


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Increase in drugs-of-abuse findings in post-mortem toxicology due to COVID-19 restrictions – first observations in Finland

Short:

Increase in drugs-of-abuse findings in PM toxicology during COVID-19

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Abstract

A lot has been published on the anticipated effects of the current COVID-19 pandemic on users of illegal drugs. In this study we present evidence-based data on such effects, namely the increased number of drug findings in post-mortem investigations.

All post-mortem toxicology cases positive for at least one of the following: buprenorphine, amphetamine, or cannabis, were investigated in the first 8 months of the year 2020 and the monthly numbers were compared to those in the previous 5 years from 2015–2019. These substances served as indicator analytes that could reveal changes in the drug using population.

Right after the government restrictions came into force in March 2020, the numbers of buprenorphine, amphetamine and cannabis findings increased. The increase was most noticeable for amphetamine and was evident in all age groups.

Our findings indicate that the assumptions on the increased risk of drug-related harm (including death) have become reality. Reduced access to harm-reduction services seems to have increased the mortality among individuals that use buprenorphine, amphetamine, or cannabis. Significant and prompt actions need to be taken in order to find new ways in helping this vulnerable group of people.

Introduction

The current outbreak of COVID-19 severe respiratory disease has profoundly changed the lives of many people all over the world. The current situation has been especially hard on those already vulnerable, such as users of illegal drugs, since access to many harm reduction services may have been limited during lock-down. Starting from early 2020, several restrictions on various activities have been imposed by governments in order to tackle the pandemic. Albeit in many ways successful, these restrictions have likely had an impact on those with substance abuse issues ¹.

In Finland, many day centres and other instances offering services to users of illegal drugs closed in March 2020 for safety reasons or started working remotely. This may have generated great anxiety and fear among those normally using these services which in turn may have led to increased substance use and related harm ^{2,3}. One example of the implications of the COVID-19 restrictions was observed in England, where needle exchange programmes faced a marked reduction in the number of visits and needles exchanged after the restrictions came to force ⁴. There are several ways the COVID-19 situation affects users of illicit drugs, such as changes in the supply of drugs or user practices, and the reduced availability of prevention and treatment ⁵. Apart from being at greater risk of overdose during the pandemic ^{3,6}, people who use drugs may also be at increased risk for getting a serious form of the SARS-Cov2 infection ².

Scientists all over the world have expressed their concern about the cuts in harm reduction services during the pandemic predicting that the harm related to drug abuse may explode ^{1,5,7-11}. However, very little evidence-based data on such effects in clinical or forensic settings has so far been reported. The aim of this study was to report on the increase of findings of abused drugs in post-mortem investigations and to investigate whether the observed increase was concentrated in certain age groups.

Material and methods

In Finland, a medico-legal investigation into the cause of death is required by law whenever the death is unexpected, or the cause of death is otherwise unclear. Approximately 16% of all

deaths undergo a medico-legal investigation, and in most cases the forensic pathologist requests post-mortem toxicology.

Here, we investigated all deaths in which buprenorphine, amphetamine, and/or 11-nor-9-carboxy- Δ 9-tetrahydrocannabinol (THC-COOH) were detected in the post-mortem toxicology analyses in any of the available sample matrices. These substances were selected since they are the three most commonly abused drugs in Finland, in addition to some sedative-hypnotics, and thus qualify as indicator substances for any changes in the drug using population. All deaths occurring in January-August 2020 were included in which one of the studied substances was detected. The monthly figures refer to deaths that occurred in that month.

At the time of writing this manuscript the information on the causes of death in the studied cases from 2020 were not yet available.

In all cases, a comprehensive screening of various psychoactive drugs had been performed using ultra-high performance liquid chromatography – quadrupole time-of-flight mass spectrometry (UHPLC-QTOFMS) followed by a confirmation analysis by liquid chromatography – triple quadrupole mass spectrometry (LC-MS/MS) for buprenorphine or by gas chromatography – mass spectrometry (GC-MS) for amphetamine and cannabis.

The monthly numbers of findings of the three selected substances during the COVID-19 lock-down were compared to those in the previous 5-year period from 2015–2019.

Results and discussion

In Finland, the coverage of post-mortem toxicology is exceptionally high, making it a good tool in monitoring trends and phenomena, since not just fatal poisonings but all presumably non-natural deaths are to be investigated regardless of the suspected cause of death. Particularly in deceased young adults, the coverage is almost population-level.

In the first 8 months of 2020, the monthly number of all post-mortem toxicology cases in Finland ranged between 465 and 623 cases (mean 527). These numbers did not differ markedly from the previous 5 years 2015–2019 (mean 521 cases, range 380–675 cases per month).

As illustrated in Fig. 1., the proportion of positive cases for buprenorphine, amphetamine, and THC-COOH increased markedly right after the government announced the lock-down measures in March 2020. When compared to the mean monthly findings of the previous 5 years 2015–2019, the number for buprenorphine in 2020 was 1.92 and 1.81 times higher, for amphetamine 1.96 and 2.91 times higher, and for THC-COOH 2.12 and 1.69 times higher in March and April, respectively.

Insert Fig. 1 here.

There was a temporary decrease in the number of findings of these three drugs in May, but the numbers increased again after the short drop. The reason for the temporary drop remained unclear.

The observed increase in monthly findings was the largest for amphetamine, for which the number of findings in March was double and in April nearly threefold compared to the average of the corresponding month over the previous 5 years. This finding is in accordance with previous reports on wastewater analyses that indicated a record amount of amphetamine being used in the Finnish capital Helsinki and the surrounding areas right after the government declared the state of emergency in mid-March ¹².

Findings of abused drugs have slowly been increasing for decades but the increase seen in spring 2020 is exceptionally large. For all three substances, the monthly numbers of findings in March and April were largest ever recorded.

In the cases we investigated, the increase did not concentrate on any particular age group. The proportion of those less than 25 years did not change in 2020 from the numbers seen in previous months although the proportion of this age group in fatal drug poisonings had been on the rise before the pandemic ¹³.

An important limitation of this study is that all findings of the selected drugs were included, not just those specifically related to drug abuse. Thus the numbers are likely to include some individuals that had taken the drug appropriately under medical supervision. This is particularly true for buprenorphine which, in addition to being widely abused, is also used to treat pain. Since the cause-of-death information was not yet available for a large portion of the studied cases at the time of writing this manuscript, changes in the actual drug-related deaths remain to be investigated later.

Conclusion

As many professionals have predicted, when harm reduction measures are cut down, drug-related harm increases and consequently also the ultimate harm: drug-related deaths. Based on our current results it is justified to say that this is already happening, but further research is required to assess the long-term effects of the pandemic. Forensic toxicology has a special role to play in rapidly demonstrating changes in drug use in the present exceptional circumstances. New approaches need to be developed and implemented to minimize harm based on scientifically valid data.

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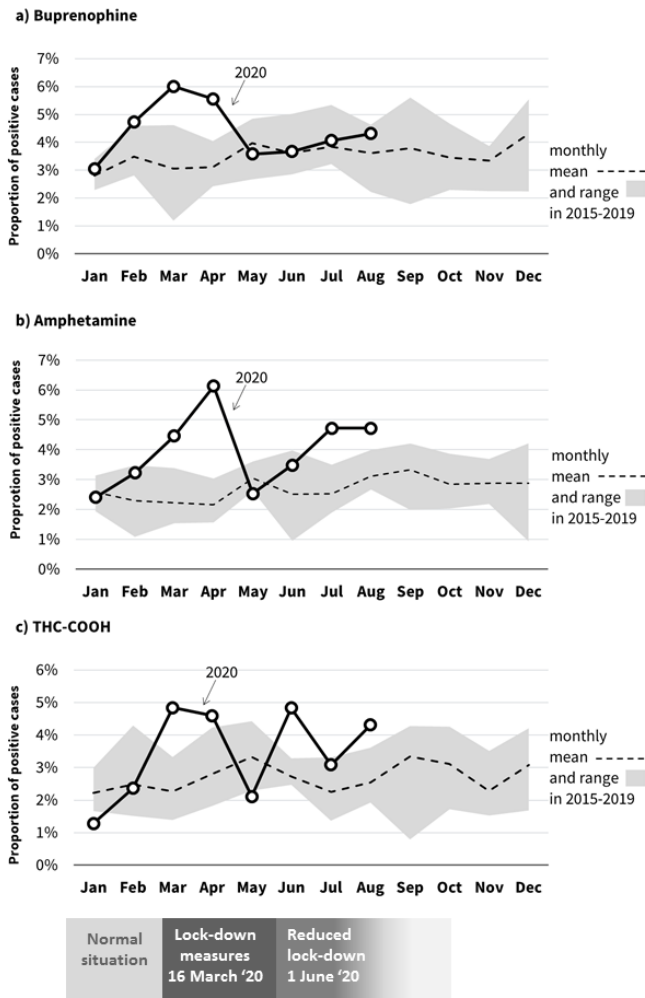


Figure 1. Progress of the government restrictions related to COVID-19 in Finland in 2020, and the monthly proportions of findings of a) buprenorphine, b) amphetamine, and c) THC-COOH of all post-mortem cases in 2015-2019 and separately in 2020.