

ABSTRACT

Infection with SARS-COV-2 virus exhibits a myriad of clinical presentations, and the pathogenesis of COVID-19 infection in various organ systems is still being understood. It is also as well as how COVID-19 infection affects certain populations. Here we present our experience with a group of COVID-positive decedents in rural Missouri referred to the Medical Examiner's Office between August 2020 and August 2021.

BACKGROUND

Infection with SARS-COV-2 virus exhibits a myriad of clinical presentations, and the pathogenesis of COVID-19 infection in various organ systems is still being understood, as well as how COVID-19 infection affects certain populations. Here we present our experience with a group of COVID-positive decedents in rural Missouri referred to the Medical Examiner's Office between August 2020 and August 2021.

METHODS

Nasal swabs were performed on 556 bodies examined at the Boone/Callaway County Medical Examiner's Office between 8/20/21 and 8/27/21. All cases examined at our office were tested without pre-selection. The exceptions were all cases during short periods of time due to funding issues, and in decedents with completely skeletonized remains.

Aptima SARS-COV-2 assay was performed on oropharyngeal swabs using the Panther system by Hologic.

RESULTS

42 of 556 decedents tested were COVID+. The manner of death for 13 of these was deemed accidental (30%), 4 were suicides (9%), 2 were homicides (4.7%), 13 were natural (30.9%), and 10 are pending at this time.

7 of 13 natural deaths were caused by COVID-19 infection, with pneumonia, coronary artery disease, and dilated cardiomyopathy being contributing factors in 3 cases. 1 death was caused by coronary artery disease, 1 by left ventricular hypertrophy, by dilated cardiomyopathy, 1 by pulmonary embolism, and 1 by respiratory/kidney failure.

The cause of death for 10 of 13 accidental deaths was drug toxicity, mainly fentanyl and/or methamphetamine. Myocardial ischemia/infarction was a contributing factor in 1 of these deaths. 2 deaths were due to blunt force injuries from motor vehicle accidents while intoxicated. 1 of the accidental deaths was a gunshot wound to the head.

Of 2 homicides, 1 was a gunshot wound to the head and 1 was abusive head trauma in an infant.

Of the suicides, 1 was caused by blunt force injuries due to a fall, 1 by a gunshot wound to the head, and 2 by suspension ligature strangulation.

Out of all the decedents during this time period, 199 of 556 total deaths examined were accidental (35.7%), 61 were suicides (10.9%), 38 were homicides (6.8%), 119 were natural (21.4%), and 106 were pending.

DISCUSSION

Although a relative increase in the percentage of natural deaths in a COVID-positive decedent population is expected, rates of non-natural deaths in COVID-infected decedents have, to our knowledge, not been studied. How COVID-19 infection interacts with risk factors for these kinds of deaths is not understood and warrants further study.

INTRODUCTION

The impact of the COVID-19 pandemic on nationwide rates of various manners and causes of death in the past three years is well-documented. A most concerning example is the increase in overdose-related deaths after the onset of the pandemic (Imtiaz et al). These observations have, for the most part, been attributed to the psychosocial and environmental effects of nationwide lockdown measures and other social effects of a worldwide pandemic.

To our knowledge, the incidence of various manners of death among COVID-19 infected decedents has not been studied. An increase in the relative percentage of natural deaths in the COVID-19-infected decedent population may be expected. However, very little is known about the psychological or cognitive effects of acute SARS-COV-2 infection, and how this may relate to suicide and accident rates among infected individuals. Here we report the rates of the various manners of death among all COVID-19 positive decedents seen at our Medical Examiner's Office.

RESULTS

Manner of Death in COVID-19 Positive Decedents

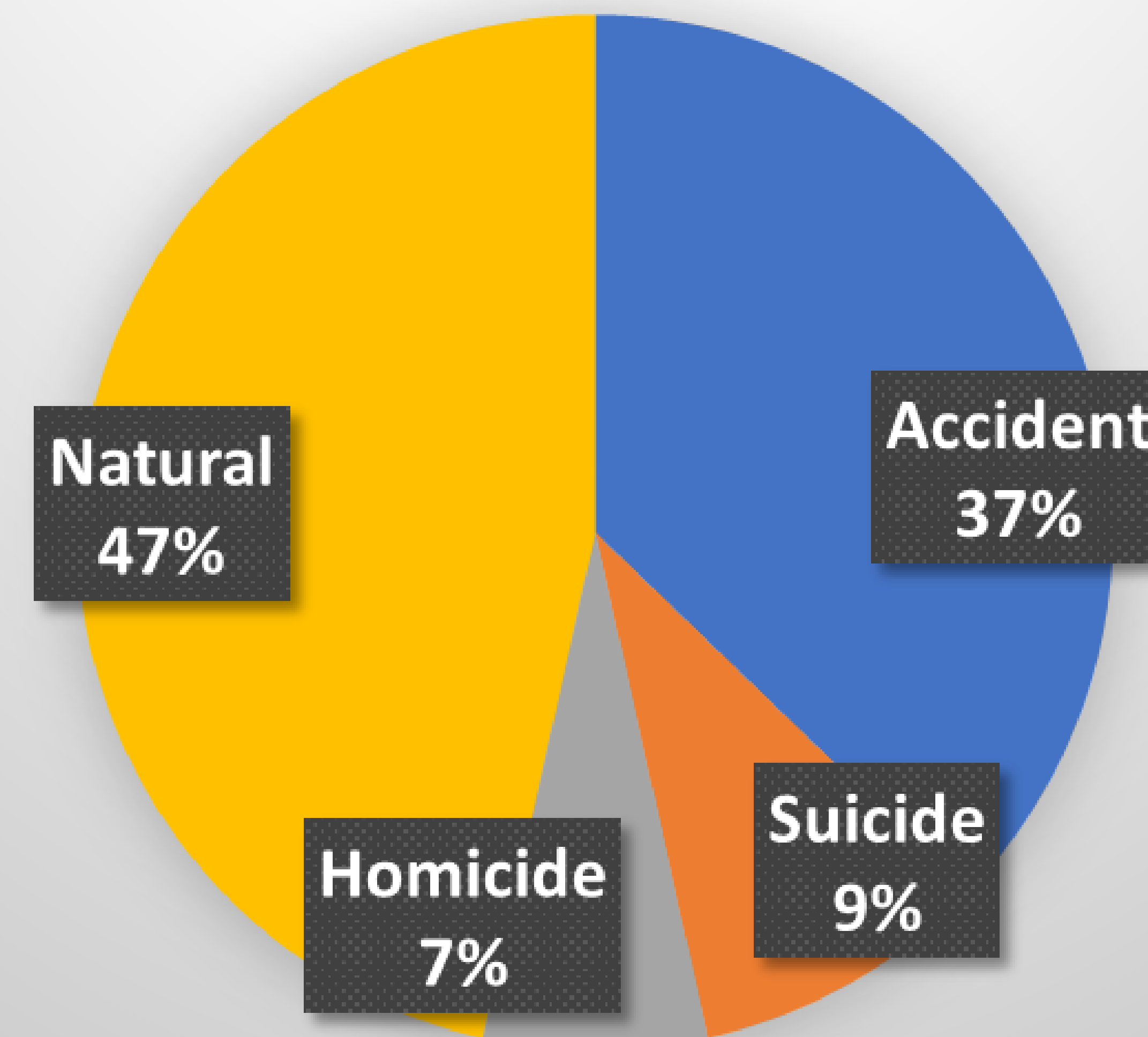


Figure 1. The rates of various manners of death in the COVID-19 positive population in the Boone/Callaway county medical examiner's office between August 2020 and August 2021. Compared to the COVID-19 negative population in the same time period, natural deaths are relatively increased.

METHODS

Oropharyngeal swab samples were performed on 349 bodies examined at the Boone/Callaway County Medical Examiner's Office between 8/20/20 and 8/27/21. Decedents examined at our office were tested without pre-selection. Testing was discontinued for all decedents during periods of low community transmission. Decedents with skeletonized remains and embalmed decedents were not tested. Cases with cause of death still pending have been excluded.

SARS-COV-2 assay (Aptima Inc, Woburn, MA) was performed on oropharyngeal swabs using the Panther Fusion system (Hologic Inc, Marlborough, MA).

RESULTS

Of 348 decedents tested between August 2020 and August 2021, 43 were COVID-19 positive, and 305 were COVID-19 negative. Of the COVID-19 positive decedents, 16 (37%) were accidents, 4 (9%) were suicides, 3 (7%) were homicides, and 20 (47%) were natural deaths.

In contrast, 141 (46%) of the COVID-19 negative cases were determined to be accidents, 47 (15%) were suicides, 35 (11%) were homicides, and 82 (27%) were natural deaths.

DISCUSSION

In comparison to the COVID-19 negative population seen at our Medical Examiner's Office in the same time period, natural deaths were increased in the infected population. Rates of suicide, accident, and homicide were therefore relatively decreased compared to the uninfected decedent population. These findings may be expected due to the known risk of respiratory failure and the increase in cardiovascular events associated with acute COVID-19 infection.

Future directions for this study could include a comparison of incidence of COVID-19 infection in the general population versus that seen in the Medical Examiner's office, or the all-cause mortality in COVID-negative individuals versus COVID-positive individuals in the general population. As the understanding of the neurocognitive and neuropsychological effects of COVID-19 increases and evolves, the relationship of acute infection with 'non-natural' manners of death may become a point of interest and shed light on the complex physiopathologic factors involved in such deaths.

REFERENCES

Imtiaz S, Nafeh F, Russell C, Ali F, Elton-Marshall T, Rehm J. The impact of the novel coronavirus disease (COVID-19) pandemic on drug overdose-related deaths in the United States and Canada: a systematic review of observational studies and analysis of public health surveillance data. *Subst Abuse Treat Prev Policy*. 2021 Nov 29;16(1):87. doi: 10.1186/s13011-021-00423-5. PMID: 34844624; PMCID: PMC8628272.