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Influence of drugs on prison suicide - A retrospective case study

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ABSTRACT

The prevalence of mental disorders and comorbidity with substance abuse and personality disorders is high in prisoners. Furthermore, drug abuse in prison is a widespread problem throughout prisons around the world. In this retrospective study, we analyzed the prison deaths over six years (2012–2017). For each death, we collected data of the Berlin prison system, the prison hospital and the State Institute for Forensic and Social Medicine Berlin and the Institute of Legal Medicine and Forensic Sciences, Charité Medical University Berlin. In total, 33 prisoners died during our study period, of which 24 committed suicide. In 25% of the suicide cases, forensic toxicology reports were positive for drugs without cases of lethal intoxication. A direct influence of drug intoxication on prisoner deaths and suicide was not common in our data. Small sample size, a missing control group, and the retrospective study design limit generalizability of the results.

1. Introduction

Suicide is the most common cause of death in prison environments, with rates being significantly higher than in the general population (Dahle, Lohner, & Konrad, 2005; Fazel, Grann, Kling, & Hawton, 2011; Fotiadou, Livaditis, Manou, Kaniotou, & Xenitidis, 2006a). In European (Cinosi, Martinotti, De Risio, & Di Giannantonio, 2013; Opitz-Welke, Bennefeld-Kersten, Konrad, & Welke, 2013; Rabe, 2012) and international studies (Baillargeon et al., 2009; Kariminia et al., 2007) regarding trends in prison suicide, methods of suicide prevention were found to require improvement to meet the needs of the prison environment. Specific risk factors for prison suicide are the unique situation (imprisonment), the separation of loved ones, pre-trial detention, small prisons, a single cell, isolation, (expectancy of) a long sentence, previous suicide attempts, violent crime and a history mental and substance abuse disorder (Bennefeld-Kersten, 2009; Daniel, 2006; Dooley, 1990; Fazel & Baillargeon, 2011; Fazel, Cartwright, Norman-Nott, & Hawton, 2008; Fazel, Wolf, & Geddes, 2013; Gates, Turney, Ferguson, Walker, & Staples-Horne, 2017; Hawton & Van Heeringen, 2009; Jenkins et al., 2005; Konrad, 2002; Marzano et al., 2016; Marzano, Fazel, Rivlin, & Hawton, 2010; Rivlin, Hawton, Marzano, & Fazel, 2010; Shaw, Baker, Hunt, Moloney, & Appleby, 2004a; Shaw, Baker, Hunt, Moloney, & Appleby, 2004b; Suto & Arnaut, 2010; Winters, Greene-Colozzi, & Jeglic, 2017).

The most common suicide methods in prison are hanging and self-strangulation (Rivlin, Hawton, Marzano, & Fazel, 2013). Although the prevalences of mental disorders and substance abuse disorders in prison environments worldwide are very high (Birchard, 2001; Blaauw, Roesch, & Kerkhof, 2000; Brinded, Alexander, Laidlaw, Fairley, & Malcolm, 2001; Fazel & Danesh, 2002; Fazel & Seewald, 2012; Fotiadou, Livaditis, Manou, Kaniotou, & Xenitidis, 2006b; Fotiadoua et al., 2004; Kouzi, Pope, Powell, Olova, & Campbell, 1997; Maden, Swinton, & Gunn, 1991; Mason, Birmingham, & Grubin, 1997; Missoni, Utting, & Psychi, 2003; Von Schönfeld et al., 2006), medication overdoses, and intoxications as a suicide method seem to be less frequent (Bartoli et al., 2018; Felthous, 2011). Research specifically concerned with the interaction of drug abuse, intoxication, and suicide in prison environments is limited. In a large follow-up study, Hayes (2012) analyzed 464 US jail suicides and found that 20% of inmates who committed suicide were intoxicated at the time of their deaths, but further information on the specific type and circumstances of intoxication (medication, drugs, time of admission) was not reported (Hayes, 2012). In a recent study, Fuh et al. (2016) aimed to characterize drug overdosing in a prison population in Ohio (USA) and identified phenytoin as the most common drug in prisoner overdosing, while anticonvulsants, antidepressants, and cardiovascular medication equally accounted for ICU admissions (Fuh, Hays, Brown, & Schirk, 2016). In a Danish study (1999), 74 prison deaths were identified over five years: 34 suicides, 22 accidents, three homicides, and 15 cases of natural death. The most frequently used suicide method was hanging,

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and the accidents were dominated by poisoning deaths, often with morphine, possibly in combination with alcohol or other drugs (Christiansen & Gregersen, 1999).

2. Aim of the study

The central aim of our study was to describe the influence of drug abuse on death in prison and the frequency and phenomenology of prison suicide events in the Berlin prison.

3. Material and methods

We conducted a retrospective data collection and analysis regarding all deaths in the Berlin prison system over six years from 2012 until 2017. Files from the autopsy reports, including toxicological reports, were viewed in the State Institute for Forensic and Social Medicine Berlin and the Institute of Legal Medicine and Forensic Sciences, Charité Medical University Berlin. Also, we analyzed the medical and prison files in the prison hospital of Berlin. Following information was attained: age, nationality, time until death, relationship status, former detention, type of offense, legal status (remand or sentenced), cause of death (suicide, no suicide), suicide method, former suicide events, medication, history of mental disorder, history of drug abuse disorder, drugs in toxicological reports, signs for intoxication or withdrawal in toxicological reports.

The type of offense was categorized as a violent offense or non-violent offense. Violent offenses included homicide, murder, manslaughter, aggravated battery, arson, rape, and sexual violence. Mental disorders were defined by the prison medical staff, based on the Tenth Revision of the International Classification of Diseases for the classification of mental and behavioral disorders.

4. Results

From 2012 until 2017, a total of 12.002 forensic post mortem examinations were performed in Berlin, Germany. Prison deaths made out 0.27% of this collective. In six years, 33 deaths were registered in the Berlin prison system. In all cases but one, male prisoners were affected (97%). The mean age of all prisoners that died during the observed period was 45.6 years. The mean time from admission to death in prison was 2.7 years. In total, 15 (45%) had a history of imprisonment, 18 (54%) were in prison due to a violent crime, 15 (45%) were remand prisoners, 9 (27%) died of a natural cause, 9 (27%) had a history of mental illness and 17 (52%) had a history of drug abuse disorder. In six cases (18%), the toxicology report was positive for drugs.

The death of the only female prisoner in our cohort was due to a case of acute peritonitis in remand custody. She had a history of mental disorder, and the toxicology report was negative. The eight men that did not commit suicide died primarily of cancer- or heart-related complications.

Of all cases of death, suicide events were found in 24 incidents (73%). For specific results regarding death by suicide, see Table 1.

Table 1
Prison suicide events from 2012 to 2017.

Suicide events 2012–17		24	100%
Age (mean)		40,87	
Time to event (days)	$n = 18$	295	
Former detention	$n = 15$	12	50%
Violent offense	$n = 21$	14	58%
Suicide by Strangulation		21	88%
Former suicide attempts	$n = 11$	9	38%
Any psychiatric medication		10	42%
History of mental disorder		9	38%
History of drug abuse		14	58%
Positive toxicology		6	25%

4.1. Method of suicide

Strangulation was the leading suicide method with 21 cases. In one case, the prisoner committed suicide through a cutting injury. One prisoner died of insulin poisoning, and another prisoner died of a carbon monoxide poisoning after taking a high dosage of zopiclone and starting a fire.

4.2. Mental disorder

In four cases a diagnosis of schizophrenia in combination with a drug abuse disorder was known, in another four cases an adjustment disorder was diagnosed, and in one case a delusional disorder with a comorbid paranoid personality disorder was documented. Of the 14 prisoners that had a history of drug abuse and died of suicide, 10 had a history of using more than one substance, the most common being cannabis and opioids.

4.3. Toxicology reports

The toxicology reports did not indicate lethal intoxication through drugs. The following drugs were identified: cannabis and methadone twice, buprenorphine, cocaine, and diazepam once. The only substance that was detected with blood levels indicating intoxication was zopiclone. Regarding prescription medication, doxepin, gabapentin, olanzapine, and trimipramine were the most common.

5. Discussion

Our results supported the fact that suicide is the most common cause of death in prison (Fazel et al., 2011). Regarding method, strangulation was clearly the most frequent suicide method in the Berlin prison. This is comparable to the results of Sakelliades et al., who analyzed a Greek cohort of prison suicide cases (Sakelliadis et al., 2013). In contrast to our findings, they found that poisoning through psychoactive substances was the second most common cause of death (Sakelliadis et al., 2013). Regarding suicide events in the general public in Berlin, drug poisoning (35.6%) was the leading cause of death, followed by polytrauma and death by hanging (Methling, Krumbiegel, Hartwig, Parr, & Tsokos, 2018). Although in our study, there was a positive toxicology report for drugs in 25%, it is interesting that there was no cause of death due to actual drug poisoning. Maybe because of the medical care system in Berlin with an easily accessible central prison hospital, lethal drug intoxications were less frequent. Still, the small effect of drug abuse on prison deaths in Berlin was unexpected. In our clinical experience, intoxications are treated regularly in the Berlin prison and are a problematic issue in prisoner health care. The absence of lethal drug intoxications may indicate a certain efficiency in suicide prevention in the prison system. Of course, it is possible that specific drug intoxications, e.g., synthetic cannabis (“spice”) or GHB, are challenging to detect and thus remain unknown in our data.

The literature on suicide due to a combination of methods is seldom, and specific data regarding prison suicide is scarce. In our data, in six cases positive toxicology reports indicate a combination of suicide methods, but only in one case (4,2%), a substance (zopiclone) was found in a blood concentration indicating intoxication. In other cases, suicide was committed by strangulation, and the positive toxicology results reflected past drug abuse, but no intoxication. In comparison to the general population of Berlin, Hartwig et al. identified a combination of suicide methods in merely 7,6% of all cases, the most relevant being trauma plus medication and drowning plus medication (Hartwig, Tsokos, & Pawellek, 2013). Thus, in prison and general society combination suicide seems to be the exception.

Comorbidity of mental disorders in prisoners with near-lethal and

lethal suicide attempts is unarguably an important issue because it increases the risk of suicide (Foster, Gillepsie, & Mc Clelland, 1997). In our cohort, 38% had a history of mental illness and 58% a history of a substance abuse disorder. After ending withdrawal treatment, one prisoner committed suicide by hanging. In this case, blood analysis was positive for methadone, cocaine, and diazepam, indicating current use without signs for intoxication. Unfortunately, it is uncertain in how far withdrawal symptoms may have possibly influenced this event. Although this was only one case, it shows the importance of medical follow-up treatment regarding the end of withdrawal treatment and management of mental disorders in general, as well as the possible influence of self-medication in prisoners (Birmingham, 2003; Wilper et al., 2009). In how far drug-related disorders, e.g., substance-induced psychosis, were present in our study remained unclear. In the official medical records of the Berlin prison, current documentation of the psychopathology before the suicide event was not available. This underlines the need for regular professional screening methods in order to identify and prevent suicidal behavior in high-risk prison populations (Voulgaris, Kose, Konrad, & Opitz-Welke, 2018). Considering that only one patient with schizophrenia (out of four) had sufficient plasma levels of the prescribed antipsychotic medication at the time of death further underlines the importance of thorough clinical documentation.

The items former detention, remand prisoner status, previous suicide attempt, and violent offense were common in our cohort. This finding confirmed the results of a recent study regarding prison suicide in Berlin (Voulgaris et al., 2018) and supported the research on specific risk factors for prison suicide (Bennefeld-Kersten, 2009; Shaw et al., 2004b; Winters et al., 2017).

6. Limitations

Our study has several limitations. We conducted a retrospective and descriptive analysis of a small sample of prison deaths and suicide events. There was no control group and, in consequence, our results are not easily generalizable and are to be interpreted cautiously.

7. Conclusion

Our study aimed to identify the influence of drug abuse in prison suicide events. Although the sample size was small, we covered a recent period of six years (2012–2017) and a large prison population of Berlin, Germany. In 25% of the suicide events, a toxicological report was positive for drugs, but only in one case, an intoxication was identified. Surprisingly, the influence of drug abuse and intoxications on suicide in prison seemed rare. Still, mental disorders in combination with substance abuse disorders are significant challenges in prisoner health care and suicide prevention.

Author contributions

AV, SH, NK, and AO-W designed the study. AV collected the data. AV, SH, NK, and AO-W analyzed and interpreted the data. AV and SH wrote the initial draft of the manuscript. AV, SH, and AO-W had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of data analysis. All authors have contributed to, read, and approved the final version of the manuscript.

Ethics statement

According to current legal regulation, no approval from the local ethics committee was required for the current study.

Declaration of Competing Interest

The authors declare that, except for income received from their primary employer, no financial support or compensation has been received from any individual or corporate entity over the past 12 months for research or professional service related to this study and there are no personal financial holdings that could be perceived as constituting a potential conflict of interest.

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