The Experience of a District General Hospital with a Large Outdoor Music Festival in England

A. Kamour, R. Yardley, M. Longshaw & J. Stuart

Abstract

Objectives: *To assess the impact of the Parklife annual music festival on the local hospital, North Manchester General.*
Methods: *Data was obtained retrospectively by analysis of emergency department records during the weekend of Parklife 2015.*
Results: *32 patients were identified, 56% reported taking drugs. 34% were admitted for overnight observation. 4 patients presented with methaemoglobinaemia following oral ingestion of amyl nitrate. One patient had a methaemoglobin fraction of 90.6%, which is amongst the most extreme recorded in literature.*
Conclusion: *Music festivals can impose a burden on local health services. Organisers should operate an efficient surveillance system in order to prevent the sale and use of recreational drugs, providing adequate on-site health services and working in collaboration with local emergency services.*

Keywords

amyl nitrate, methaemoglobinaemia, novel psychoactive substances, mass-gathering events, music festivals

Key learning points

- Music Festivals can increase the burden on local healthcare providers, especially as a result of the recent surge in popularity of Novel Psychoactive Substances (NPS).
- Although several high-profile cases of NPS toxicity at such events have been reported in the media, evidence regarding their effects on local healthcare providers is lacking.
- This observational study from an emergency department in Manchester UK, with a large music festival in close proximity, highlights the new and dynamic challenges facing the UK's emergency departments during these events.
- Local authorities and organisers should adequately plan to mitigate the risk of adverse health events to individuals during such events and minimise the additional unexpected burden on local healthcare providers.

Introduction

Every year, hundreds of thousands of people attend dozens of music festivals across the UK. Whilst the vast majority of festival-goers have a safe and enjoyable time, some require medical attention for a variety of conditions, ranging from minor injuries to life-threatening illnesses. These medical conditions may necessitate a hospital visit, resulting in an increased burden on the local healthcare services. In addition, in the UK as in many countries in the developed world, there has been growing concern around the use of novel psychoactive substances (NPS) at such events, especially following recent high-profile cases of toxicity.[1-4]

In this article we describe the experience of a district general hospital in England which is located in close proximity to a popular music festival.

Parklife 2015: The North Manchester General Hospital Experience

Parklife is a music festival that has been held in Manchester every June since 2010. In 2012 the festival relocated to Heaton Park, a few miles north of the city centre. Since then, the event has grown and now attracts in excess of 70,000 patrons on both days. In 2014 the festival received widespread media attention after a young man was assaulted at the event and subsequently died of his injuries. In the same year, there were two non-fatal stabbings and 29 people were arrested on various charges.[5]

North Manchester General Hospital, an NHS district general hospital with 200 medical beds is located less than two miles from the festival site and is therefore the primary referral hospital for Parklife.

Despite event organisers stating on their website that "Parklife Weekender has zero tolerance for drugs and legal highs", during the 2015 festival several of its patrons attended the emergency department at NMGH following drug ingestion.[6]

We aimed to determine the scale of increased burden on the local emergency department, the events leading to ED attendance, and whether enhanced planning of such events in the future may lead to improved patient safety.

Methods

The data were collated by retrospective retrieval of records of all patients who attended the NMGH

A. Kamour
MRCP, Acute Medicine and Toxicology, North Manchester General Hospital

R. Yardley
MBChB, ACCS Anaesthetics, Royal Preston Hospital

M. Longshaw
FRCP, Critical Care, North Manchester General Hospital

J. Stuart
FRCS FCEM, Emergency Medicine, North Manchester General Hospital

Correspondence:
Ashraf Kamour
Medical Assessment Unit, North Manchester General Hospital, Delaunays Road, Manchester, UK. M8 5RB
Email: ashraf.kamour@nhs.net

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Box 1:

A 26 year old woman presented in a deep coma with respiratory insufficiency, cardiovascular collapse and significant ST segment depression across all ECG chest leads. She had severe lactic acidosis with a pH of 7.11, lactate of 16.3 mmol/L and methaemoglobin fraction of 90.6%. 1mg/Kg methylene blue, prepared prior to her arrival, was administered immediately after the diagnosis was confirmed using a point-of-care arterial blood gas analysis. Due to the severely elevated methaemoglobin fraction, a second dose of methylene blue was administrated as soon as additional intravenous access was obtained. The methaemoglobin fraction diminished rapidly, with concurrent improvement in respiratory effort, cardiovascular system and conscious level. The ST depression resolved within an hour. She was then transferred to the High Dependency Unit for continued observation. Following a complete recovery within 2 days, she was discharged from hospital.

Emergency Department between 10:00 on Saturday 6th June 2015 and 12:00 on Monday 8th June 2015. Patients who had attended the festival were identified and information such as age and sex, presenting complaint, history of alcohol and/or drug use and medical management received was extracted from their records. In addition, the level of toxicity was estimated using the IPCS/EC/EAPCCT Poisoning Severity Score (PSS), a validated grading system of 4 categories, ranging from 0 (no signs or symptoms related to toxicity) to 3 (severe or life threatening toxicity).[7] The maximum PSS was recorded, quantifying the most severe signs and symptoms from the time of exposure to the time of the assessment.

Results

32 patients presented to NMGH from the 2015 Parklife festival: 13 males and 19 females with a median age of 21 years. 12 patients presented on June 6th, 14 on June 7th and 6 on June 8th. Of the 32 patients, 18 patients (56%) admitted to taking drugs, of whom 10 were male and 8 were female. Drugs taken, as reported by the patients, included ecstasy, Brown-USB, magic mushrooms, cocaine, BK2CB, UFO and amphetamines. 6 patients had a maximum PSS of 1, 11 had a score of 2 and 1 patient had a score of 3. Ecstasy was the most popular drug, reported by 6 patients. Problems due to alcohol intoxication were recorded in 6 patients, who presented with falls and injuries, vomiting and abdominal pain. Of the remaining 7 patients, 4 presented with abdominal pain, 2 following assault, 1 with seizures and 1 with accidental injury. 20 patients were discharged on the same day, 11 were admitted for overnight observation and 1 patient remained in hospital for 2 days.

Of particular note, 4 patients presented with varying degrees of drug induced methaemoglobinaemia following oral ingestion of amyl nitrate ("poppers") reporting that they thought it was alcohol (Table 1). One of these patients, a 26-year-old female, developed a severe degree of drug induced methaemoglobinaemia (Box 1) with a methaemoglobin fraction of 90.6%, amongst the most extreme recorded in literature.

The 3 other patients who presented with amyl nitrate toxicity were also treated with methylene blue, with a dose of 1-2 mg/kg depending on the symptom severity. All recovered with no long term adverse sequelae. (Table 1)

Discussion

On 6th and 7th of June 2015, Parklife Festival was hosted at Heaton Park, Manchester. More than 70,000 patrons attended each day. During the event a number of attendees became seriously unwell after consuming recreational drugs and were taken to the NMGH hospital. The police made a total of 55 arrests, the majority of which were for the possession of recreational drugs with intent to supply.[8]

It has also been alleged that official vendors had been selling the drug amyl nitrate ("poppers") labelled as "Liquid Gold", which some attendees drank assuming it was a form of alcohol 'shot'.[9] Following amyl nitrate ingestion, a number of festival goers became unwell. Parklife event organisers responded by discontinuing the sale of amyl nitrate. Police confiscated 400 bottles of the product. The subsequent Health and Safety Executive investigation concluded that no offences were committed, commenting that "It seems the people involved made a mistake and thought they could drink them".[10]

Table 1. Cases admitted with drug induced methaemoglobinaemia following amyl nitrate ingestion

Case	MethHb Level	Clinical presentation
Male	40.6%	Cyanosis, nausea, vomiting, lactic acidosis
Male	58.3%	Cyanosis, confusion, abnormal jerky movements
Female	44.5%	Cyanosis, sinus tachycardia
Female	90.6%	Cyanosis, poor respiratory effort, sinus tachycardia, hypotension, global ST depression on ECG, GCS 3/15, severe lactic acidosis

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There are important limitations in this study that need to be considered. The number of patients who presented to the NMGH emergency department is unlikely to accurately correlate with the number of festival patrons who used illicit drugs or with those requiring medical attention for other reasons, because help is less likely to be sought for mild symptoms. In addition, there is the possibility that some patients might have attended a hospital other than the NMGH. Finally, analytical confirmation of toxin exposure and the scientific elimination of other potential toxins were not available.

Recreational drug use has become synonymous with music festivals around the world. During a 2013 three-day music festival in New York, USA, 22 festival goers became ill and required transfer to hospital; of these 9 were in a severe condition and 2 were fatal. The first fatality tested positive for MDMA, the other positive for MDMA and methylone.[11] The following year, festival organisers implemented a surveillance system designed to promptly identify adverse health events. This system involved roaming teams of volunteers who identified attendees requiring medical attention, as well as employing stricter entrance procedures by refusing entrance to those visibly under the influence of drugs or alcohol and by the obligatory viewing of harm reduction warning messages before patrons were allowed into the festival site. These extra safety measures led to a decrease in the number of severe adverse medical events, with 2 severe drug-related cases with 1 fatality, which was attributed to the use of methamphetamine.[11]

In the UK, data obtained in 2012 through the Freedom of Information Act revealed that quantities of drugs seized at music festivals across the UK decreased considerably since the peak at 2009. However, the 2011 seizure at Glastonbury of drugs worth a street value of £44,868.65 represented a rise of more than 10% on the previous year. Similarly, the total street value of all drugs seized during *Bestival* on the Isle of Wight in 2012 was approximately £18,500, amounting to a 20% increase when compared to the previous year.[12,13]

Overall between 2009 and 2011, seizures of cannabis, cocaine and ecstasy fell by over 60% while that of piperazine and ketamine steadily increased. Interestingly, the type of recreational drug confiscated by authorities during the festivals varied with individual events. At the Isle of Wight's *Bestival*, the most frequent drugs seized were cocaine and ecstasy, while at Glastonbury the largest haul was piperazine followed by cannabis.[12,13]

In recent years, the availability of recreational drugs and in particular Novel Psychoactive Substances (NPS), during music festivals has been a cause of major concern. In March 2015, a letter from the Minister for Crime Prevention to festival organisers highlights ongoing concerns around the availability of so-called "legal highs" at music festivals. In the letter the Minister encourages festival organisers to consider public safety measures and to work with the police and other agencies to achieve these aims. However, these measures are only offered as recommendations for consideration rather than being incorporated into law or regulation.[14]

It has previously been stated that approximately 1% of people attending mass gatherings require medical aid. A prospective observational study assessing the impact of a major music festival on the workload of a local hospital found that 1.7% of the festival attendees sought medical attention and of those 1.7%, 5% received treatment at the local ED. The majority (94%) were referred to the ED by the festival on-site medical team, however 3 patients self-presented and 1 was referred by a local General Practitioner. It was noted that 47% of the festival-related admissions to the hospital were associated with alcohol and /or illicit substances and of these 42% were related to substance misuse alone. As a result, the workload of the local ED increased by approximately 45%.[15]

In terms of both quality and quantity, festival on-site medical facilities vary considerably from one event to another. Glastonbury festival's facilities include a fully-equipped medical centre staffed by a wide range of medical staff and allied health professionals and with its own X-ray facility, as well as 2 walk-in centres and numerous first aid stations.[16] However, in terms of the size of the festival and the organisation of medical provision, Glastonbury represents one end of the scale; its approach is not replicated consistently across the industry.

It is important to bear in mind that for any festival, attendees may not use the on-site medical facilities, preferring instead to self-present to the local ED. The local ED is also the referral destination for any cases that are unmanageable on the festival site. These additional patients represent an extra burden on local secondary care facilities. However, this phenomenon is not currently well-recognised by organisers and planners.

In several Western countries, there are codes and laws which regulate the operation of outdoor gatherings, including music festivals, with the aim of reducing the risk of adverse health events. In Ireland for example, the Event Industry Association produced a Code of Practice detailing the medical safety obligations of event organisers, including the provision of a major emergency plan and of an on-site medical team.[17] The State Government of Victoria, Australia, has published a Code of Practice for safer

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music festivals and events, requiring organisers to directly liaise with local hospitals and emergency services in order to conduct a formal health risk assessment and to develop an emergency response plan.[18] The Code also details the requirement for on-site medical support, including personnel, structure, and layout.

By imposing a sizable burden on local health services mass gathering events can be challenging to healthcare providers. This challenge is heightened with the increased popularity of NPS among festival goers, and is additional to increasing demand currently experienced by the UK's emergency departments. Organisers should adequately plan to mitigate the risk of adverse medical events by providing appropriate on-site medical facilities and by operating efficient surveillance systems to prevent the sale and use of recreational drugs as well as to identify unwell patrons and bring them to early medical attention. This plan should be developed in liaison with local healthcare and emergency services and should be governed by regulations or Codes of Practice developed by the relevant agencies and implemented by local councils and authorities. It would be expected that in the case of large-scale festivals these measures will have a positive effect on medical outcomes, particularly in cases of toxicity due to drug abuse, whilst minimising additional burden on local healthcare systems.

Conflicts of interest

None.

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