

Medical emergency care and patient contact at the Quart Rock Festival in Norway

Abstract

Background. The annual Quart Rock Festival (1991–2007) was the largest rock festival in Norway. During festivals in 2004–06, a daily average of 3 000 personnel, guests and artists, and 10 000 visitors (i.e. 13 000 people) were present daily. The festival had a medical care organization recruited from primary care personnel, which included a general practitioner, a physiotherapist, nurses from the municipal out-of-hours service, and lay personnel trained in first aid.

Material and methods. We recorded all patient contacts at the festival in 2004, 2005, and 2006 in order to describe injuries requiring medical attention and the need for medical preparedness.

Results. The total number of festival participants, including personnel, was 208 000 during the registration period. Of totally 1 349 patient contacts, 254 required consultation with a nurse and 191 with a physician. There were no deaths, cardiac arrest, respiratory collapse, or serious penetrating trauma. 33 contacts were related to intoxication: 24 to alcohol, five to illegal drugs and four to unknown substances. Violence-related injuries were the cause of 18 contacts, of which none were serious. 49 patients were referred to other care providers (mostly to the municipal out-of-hours service or their own physician) and five patients were admitted to hospital. Five patients needed acute hospitalization, i.e. 0.24 per 10 000 festival participants.

Interpretation. The results are similar to those in studies of rock festivals in other countries and indicate that the primary care based medical organization at the Quart Festival was adequate.

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Mass gatherings are usually defined as events attended by more than 1000 people for a specific purpose over a given period of time. Examples are sport events, political meetings and demonstrations, large religious meetings and music festivals. Sanitary arrangements during such events are often called «mass gathering medical care (MGMC)». The need for help depends on the weather, topography, type of event, duration, peoples' moods, number of participants, density of participants, participant age and degree of alcohol and substance abuse (1). Rock concerts and rock festivals have high scores on variables which indicate a high need for medical preparedness (1, 2).

The Quart festival in Kristiansand (1991–2007) is history. The festival became bankrupt (6 June 2008) as many other honourable festivals have before it. It was Norway's largest and most exciting rock festival in its last decade of existence. During festivals in 2004–06, a daily average of 3 000 personnel, guests and artists, and 10 000 visitors (i.e. 13 000 people) were present daily. The festival area was on the Odder island, a natural resort close to the centre of Kristiansand. The medical preparedness at the Quart festival was organized within the primary health services, as opposed to similar events abroad where sanitary personnel are mainly recruited from the second line (1–7). No official Norwegian guidelines or recommendations are available for this type of medical activity.

We have recorded all patient contacts with all types of sanitary personnel (physician, physiotherapist, nurse and other health personnel) at the festivals in 2004, 2005 and

2006, with special focus on contacts related to substance abuse and violence, serious injuries and a need for further referral.

Material and method

The Quart sanitary unit was managed by the medically responsible physician and was an independent unit within the festival organisation. It was localised around two tents at the side of the main stage. One area behind the sanitary tents was an observational post and functioned as a place for stretchers. The areas were concealed from insight and separated from the other area by fences. There was a passage from the front of the stage directly to the sanitary site, where injured or unconscious people could be transported quickly. There were also two smaller satellite posts for simple first aid and water supply at the smallest stage and in the catering area. In addition there was a patrol boat with sanitary personnel on the sea.

The sanitary personnel consisted of a physician, normally a general practitioner. During the main concert the doctor worked as a team leader in the tent and at the stretcher site. Two nurses with experience from out-of-hours medical services were overall responsible for prioritizing and operating the stations. Nurses managed assisting personnel from the Red Cross and the Norwegian people's aid, normally 10 people per festival day. In addition there was a physiotherapist with broad general competence, three voluntary helpers in the age 14 to 19 years and a secretary, who were responsible for medical records and dossier control. There was usually no change of personnel during a concert day. All treatment during the festival was for free.

Main message

- There were no records of deaths or cardiac arrest, respiratory collapse or serious penetrating trauma at the Quart festivals in 2004, 2005 and 2006
- The pattern of injuries corresponds with that from similar studies in other countries with overweight of small and uncomplicated wounds, treated locally without further referral
- The findings indicate that the medical service was adequate



Rock jargon: The stretcher site «Medical chill out» behind the sanitary tent at main station 1. Both photos Tor Erik Schrøde

Recording

We developed and tested a form for recording of injuries in 2003; and in 2004, 2005 and 2006 we recorded all patient contacts in the festival area. Distribution of water and earplugs was not registered. The form was based on that from the Roskilde festival from 2002 (personal communication from the Roskilde sanitary unit), but was simplified and adapted to organization of the Quart festival. The form had to be simplified, as personnel from the Red Cross and the Norwegian people's aid were meant to complete it manually, often with insufficient light during noisy events. The form consisted of

three parts: one for name, sex, age and site of injury, one for type of injury/contact reason and one part for the treatment provider.

Referrals internally between treatment providers and externally with providers outside of the festival organization were registered. The form also had a separate box for medical records (to be completed by doctors and physiotherapists).

Health personnel without formal medical/diagnostic competence recorded type of injury and reason for contact consecutively. These recordings were more general and less detailed and were separated into two main categories. The main category A con-

Table 1 Overview of 1349 patient contacts during the Quart festival 2004–2006

Festival participants and guests	921
Managers, guards and stage workers	405
Artists	12
Unknown	11
Women	743
Men	606
0–10 years	7
11–20 years	562
21–30 years	517
31–40 years	171
41–50 years	43
51–60 years	5
Age unknown	44

cerned the treatment providers' assessment of the condition's cause and was divided into accident/injury, violence, disease, substance abuse, stress and other. Main category B concerned the treatment providers' assessment of the condition's disease or injury category and was divided into bone/joint injury, burns, poison, wounds, stage squeeze, disease and other type of injury. Except for bone/joint injury and other type of injury, the categories were divided into two to four sub-groups. The two main categories enabled us to combine recordings done by the assisting personnel with the sets of injury types/contact reasons we wished to measure (tab 1).

Before the beginning of each festival the form and its completion was explained to all assisting personnel, and registration routines were described in writing. A secretary (medical secretary/nurse) was responsible for collection, reading through and following up incomplete or missing forms. The statistics programme SPSS was used for statistical assessment of the data.

Results

1349 patients were registered during three festival weeks, i.e. 16 festival days. According to the festival management there were about 208 000 guests, artists, personnel and public in all, which meant that there were 65 patient contacts per 10 000 festival participants on average. Table 1 shows the patients' age and sex distribution.

Table 2 shows injury and disease causes for all patient contacts. No deaths, cardiac arrest, respiratory collapse or penetrating trauma were recorded. Of the 33 contacts mainly related to substance abuse, 24 were related to alcohol, but illegal substances were assumed to be the primary cause in five patients (four cases were not specified). 18 contacts were caused by violence, but none were serious enough to result in hospitalization. In 2005, a tear gas container was thrown in among the public and resulted in a rush of patients with annoying, but unhar-



Evening atmosphere at Bendik bay 2006

ful symptoms from the mucous membranes in the nose, larynx and conjunctiva.

More than half of patient contacts were caused by accidents or injuries. 462 of these were wounds, most of them blisters and superficial scratches. 18 patients needed more than one treatment for wounds and/or stitching, of which 15 were performed by the on-site-physician. 146 patients, 23 of whom were unconscious, were squeezed on stage,

which is a festival-specific diagnosis. Squeeze on stage is characterized by dyspnea, pain in the costal phragma, possibly in combination with mild symptoms of anxiety and hyperventilation, unconsciousness and simple dehydration. Unconsciousness in our system means that the patient could not stand on his own at the first contact, not give explanations and not answer immediately when spoken to. After being placed on

stretchers, everyone in this group quickly regained consciousness. Pain accounted for 267 of the 302 patient contacts that were recorded as disease; mild to moderate headache, unspecific abdominal pain or menstrual pain were the most common complaints. Cases of mild infection, allergy and exacerbations of asthma were recorded.

The assisting personnel and nurse treated 772 patients (including one rescue from sea) and 254 patients (tab 3). 191 patients needed help from the physician on duty. Four patients had an unknown treatment status. The physiotherapist treated 128 patients, mainly stage workers and guards with acute pain and stress conditions. Treatment could be completed for the majority of them on site. Most of the 114 internal referrals were to a physician or physiotherapist.

15 patients were further referred to the out-of-hours services. 10 of these were for confirmation and possible treatment of suspected fracture, joint or tooth damage. 22 patients were referred to their regular general practitioner. Causes for referral were removal of stitches, control of less acute injuries and follow-up and control of infection treatment. Five patients were hospitalized as immediate help, all in 2004, for overdose with GHB, clinical bimalleolar fracture, clinical fibula fracture, deep laceration with cartilage injury in the ear and diffuse neurological symptoms. Seven patients were referred to other treatment/service providers, i.e. dentist, psychologist or police.

Table 2 Injury and causes of disease for 1349 patient contacts at the Quart festival 2004–06

Type of injury /disease	2004	2005	2006	Total
Strain (tendon inflammation, strain-related neck, shoulder and back pain etc.)	43	39	54	136
Substance abuse (alcohol and illegal substances)	9	12	12	33
Disease (headache, abdominal pain, allergy, infections etc.)	79	96	127	302
Tear gas (including symptoms of tear gas exposure)	0	28	0	28
Accident/injury (acute wound, soft tissue and bone injury)	226	290	251	767
Violence (deliberately done by another person)	8	7	3	18
Other (unspecified)	18	4	30	52
Unknown	2	0	11	13
Total	385	476	488	1 349

Table 3 Number of patients treated on-site or referred to others during Quart festivals 2004–06

	2004	2005	2006	Total
Treatment completed by Quart sanitary personnel	304	436	433	1 173
Referred internally to doctor, physiotherapist or nurse	54	33	27	114
Referred to regular general practitioner outside of the festival area	8	4	10	22
Referred to out-of-hours services	9	1	5	15
Referred to hospital	5	0	0	5
Referred to another treatment/service provider (dentist, psychologist, police)	1	1	5	7
Not recorded	4	1	8	13
Total	385	476	488	1 349

Discussion

In this study of the sanitary services at the Quart festival in 2004, 2005 and 2006 no deaths, cases of cardiac arrest, respiratory collapse or serious penetrating trauma were recorded. Serious medical occurrences and occurrences with a fatal outcome are very rare in large music events for youth. Grange and collaborators reported no cases of cardiac arrest or respiratory collapse in an overview of more than 1.2 million onlookers at 653 rock concerts (2). Articles from large events such as Toronto Rocks! reported the same (3). A tragic exception is the Roskilde accident the summer 2000 when nine young men died of asphyxia on the main stage during a concert after lying on the ground in a crowd in front of the stage (8).

There were 65 patient contacts per 10 000 participant in our study. This corresponds to the mean at similar rock arrangements abroad, but there is a large variation (1, 3, 4, 9, 10). Studies confirm that substance abuse problems are a smaller medical problem in festival areas than the media tend to present. This also applies to other Nordic festivals (9). Reports from concerts and festivals outside of the Nordic countries show a somewhat higher occurrence of substance abuse-related patient contacts (1, 3, 4). Suy and collaborators reported intoxication as contact cause for 17 % of all patient contacts and

81 % of patient contacts with a doctor during a large rave event in Antwerpen in 1999 (6).

The occurrence of violence-related episodes at rock concerts and rock festivals varies, but especially violence associated with the use of alcohol is mentioned as a potential problem in many review articles (1,2). We recorded 18 injuries caused by deliberate violence in the festival area during three festival weeks. With 13 000 participants per day, a heated atmosphere, crowds and serving of alcohol we consider this to be a low number. At the Midfyn festival in 1988, 5.2 % of the injuries were caused by violence (11). In reports from the Roskilde festival in 1985 (11) and the US festival in 1982 (4), the incidence of violence is said to be low, but no exact numbers are given.

The pattern of injuries in our study corresponds with similar studies abroad, with an overweight of small and uncomplicated injuries where most were treated locally without further referrals. Also the types of complaints were the same as for other festivals: uncomplicated pain problems, some allergies and infections. Dehydration and heat-related complaints are frequent causes in other studies (1–3, 5), but the Quart festival had sufficient water and access to fluid, open air stages, closeness to the sea and sufficient space for the public, so this was not a problem there.

Stage squeeze was the most important diagnosis during the main concerts. It may seem dramatic when unconscious adolescents are dragged over the barricades in front of the stage and carried into the sanitary area on a stretcher. Over-heating is a common cause for problems in an international perspective, but it was not an important factor at the Quart festival, with cool Nordic evening temperatures and good ventilation. Correct evaluation and observation of the patients with stage squeeze during difficult light and noise conditions is one of the most important tasks for doctors and nurses. All such patients need to be attended to by a doctor or nurse. According to our routines all should have water, crackers, glucose and warm carpets and should be under continuous surveillance by assisting personnel. They can only be discharged by a doctor or nurse. No acute referrals were needed for this patient group.

The sanitary personnel available were able to provide the needed treatment to most patients with injuries or other medical problems. Five ambulance transports were necessary for acute hospitalization, all in

2004; i.e. 0.24 per 10 000 participants. In a large material from 201 Australian mass gatherings of several types, the number of ambulance transports to hospital was 0.27 per 10 000 participants (12), at a rock festival in Toronto in 2003 the number was 0.5 (3) and in Monster Rock, Leicestershire, England in 1992 it was 1.6 (10). The number of external referrals was 49, i.e. 2.4 per 10 000 participants (3.1 if all personnel are excluded) during the Quart festivals, 6.2 at the Roskilde festival in 1992 (10) and 12.9 per 10 000 participants during the Midfyn festival in 1988 (13). The number of ambulance transports and external referrals at the Quart festival corresponded with or was lower than that for larger mass gatherings abroad. This indicates that the Quart festival's primary health service preparedness and approach was adequate and sufficient. We also consider the availability of treatment personnel in three competence areas to be adequate. Internal (114) and external referrals confirm the usefulness of having an on-duty-physician as the main responsible for mass gatherings of a certain size (5, 11, 14).

65 of the patient forms had an unknown or other injury/disease status. This may lead to misinterpretation of the results. The proportion is low compared to the total material. We have chosen to include these, as the total number of patient contacts was important for assessment of several variables. 13 of the patient forms had unknown treatment status. This also opens up for misinterpretation of the results. None of these patients were however referred to outside the festival area.

Our study has several limitations. Most forms were completed and signed by assisting personnel without diagnostic competence beyond first aid training and corresponding experience. The injury categories were broad and did not adhere to any standardized diagnostic classification system. The beginning darkness, high activity and noisiness during the last hours of a festival day may have increased the risk of misclassification. The Quart festivals had a special southern touch, and our findings may not be relevant for festivals in other places. Our results are strengthened by the following: stability of personnel (same during the entire study), one appointed secretary was responsible for controlling and collecting all the forms, the personnel had sound festival experience, a simple registration form was

used and this was improved after a pilot project in 2003.

There is no international consensus on necessary medical preparedness and equipment for this type of mass gathering. Local and national guidelines have been made (1,7), but not in Norway. We believe that Norwegian guidelines should be made for medical preparedness and quality assurance for recording of patient information during this type of mass gathering.

Declared conflicts of interest: None

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