Characteristics of Patients at A Taipei Summer Rock Concert Festival

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Background. Rock concerts are popular mass gatherings in Taiwan. Millions of fans participate in rock concerts in Taiwan each year. However, there were no reports on the characteristics of the patients seen in rock concerts in Taiwan.

Methods. Medical care for a summer rock concert festival held in an outdoor stadium in Taipei was coordinated by emergency physicians of a medical center. About 50,000 attendees participated in the two-night concert. Three stations were set up to provide vide ad vanced medical care. A standard protocol was used to collect information about patients.

Results. A total of 28 cases visited the medical stations, fourteen cases each day. They were aged from 13 to 40 years, with an average of 20.8 ± 6.4. Twenty-one cases were female and seven were male. Twenty-two (79%) were spectators, five (18%) were on-duty staff, and one was a bystander. Based on an estimation of 50,000 participants in the stadium for this two-night festival, the medical use rate was roughly 5.6 PPT (patients per thousand attendees). The most common major problem was fainting which accounted for 13 cases (46%). Of these 13 cases, three cases (23%) lost consciousness and 12 cases (92%) were female. Sixteen cases (57%) were classified as requiring ALS (advanced life support) and 12 cases (43%) as requiring BLS (basic life support). Most cases improved and were discharged after on-site treatment. Only one case was transferred by ambulance due to persistent chest pain. However, she recovered several hours later.

Conclusions. By this preliminary data, first reported in Taiwan, we found that the most common problem was fainting. More than half of the cases seen at the concert required advanced life support. A well-designed emergency medical service (EMS) system is mandatory to provide services for these events. [Chin Med J (Taipei) 2001;64:525-530]

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to participate in these mass gatherings in Taiwan, there was no report on the characters, tics of the patients seen at the rock concert. We conducted a prospective study to assess the characters, tics of patients seen at a summer rock concert.

Methods

Medical care for a summer rock concert held at Taipei Municipal Stadium was coordinated by emergency physicians of a medical center. The concert was held on the infield areas of the race circuit. About 50,000 attendees participated in the concert on July 31 and Aug. 1, 1999, from 7 to 10 p.m. The concert included a warm-up band, which played each night from 6 to 7 p.m. The spectators were allowed to enter the stadium after 6 p.m. Three medical care stations were set up to provide medical care. Two stations were located outside, one on either side of the stage, and one station was located inside near the entrance. Each station was staffed by one emergency physician, two to five emergency nurses, and three to six other medical staff (including non-emergency doctors, medical students, non-emergency nurses, emergency medical technicians), and equipped with facilities able to perform advanced cardiac life support. An ambulance was waiting outside at each of the two entrances to the stadium. Ambulance transport was considered only when the patient presented life-threatening conditions such as altered mental status, poor perfusion, chest pain, and shortness of breath, and did not improve after five minutes of treatment. Medical care stations started from 4 p.m. and lasted until about 11 p.m. on both days. A three-hour medical training course was delivered to the medical staff the day before the concert. The courses included emergency medical services for mass gatherings, communication systems, triage criteria, the principle of transport, the scenario of emergency cases, mass casualty and disaster response. There were also a brief and major incident drill at the concert on each day before the event.

A standard form was used to collect information on the patient’s identification and demographics, data, types and causes of injuries, time of visit, complaints, physical findings, tentative diagnoses, treatments and dispositions. Each chart was recorded by the medical staff and checked by either physicians or emergency nurses. After the concert, each data form was reviewed by the principal investigator and then by another emergency physician. In case of discrepancy in classification, a third emergency physician was introduced to the principal investigator for complete review. The level of medical care was divided into basic life support (BLS) and advanced life support (ALS) according to the severity of illness or injuries initially, modified by the classification by Sanders et al. Classification was first made by the principal investigator and then by another emergency physician. In case of discrepancy in classification, a third emergency physician was introduced to review the record and establish agreement. Descriptive and simple statistical methods were used in this study.

Medical care use rate was defined as patients seen by medical staff divided by attendees, represented by patients per ten thousand attendees (PPTT). Syncope was defined as transient loss of consciousness with postural collapse. Faintness was defined as prodromal symptoms of syncope that reflects brain ischemia to a degree insufficient to impair consciousness. It represented cases who were unable to see, had weakness of the legs, or were unable to stand but with out altered mental status. Fainted, fainting spells were defined as rough terms which included both faintness and syncope. Illness or injuries initially, modified by the classification by Sanders et al. Clasification was first made by the principal investigator and then by another emergency physician. In case of discrepancy in classification, a third emergency physician was introduced to review the record and establish agreement. Descriptive and simple statistical methods were used in this study.

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earaches, eye pain, red eye, hoarseness, insomnia, nausea, diarrhea, blisters. 

Results

A total of 28 cases were taken care of, 14 cases each day. They were aged from 13 to 40 years, with an average of 20.8 ± 6.4. There were 21 female and seven male cases. Among these cases, 22 (79%) were spectators, five (18%) were on-duty staff and one was a bystander (Table 1). From an estimation of the 50,000 attendees in total, with about 25,000 each night in the stadium, the medical use rate was roughly 5.6 PPTT. Ten patients (36%) were taken care of before 7 p.m., the beginning of the concert. There were two peak volume loads of patient visits (Fig 1). The most common problem was fainting, which accounted for 13 cases (46%) (Table 2). Next on the list were six cases (21%) of abrasion and/or laceration and/or contusion, three cases (11%) of conjunctivitis, and two cases of abdominal pain. The common complaints included 13 cases of dizziness, 12 cases of weakness and/or ataxia and seven cases of headaches. Of the 13 fainting cases, 12 (92%) were female. These cases were aged from 14 to 24 years, with an average of 17.9 ± 2.7 years and a median of 18 years. Three cases (23%) were of conscious loss. Ten (77%) cases fainted after the first hour of the rock concert (Fig 2). Of the 28 cases, 16 cases (57%) were classified as requiring ALS and 12 cases (43%) as requiring BLS. There was no discrepancy between two reviewers. Most of the cases improved and were discharged after onsite treatment. Only one case was transferred by ambulance due to persistent chest pain. However, she recovered several hours later.

Discussions

Mass gatherings have been an area being studied increasingly over the past several years. A mass gathering is defined as a collection of more than 1,000 people at one site or location. The incidence of injury, illness and cardiac arrest at mass gatherings is higher than in the general population. Medical service systems at

| Table 1. Demographics of 28 patients at the rock concert |
|---------------------------------|-----------------|-----------------|
| Age                             | Identification  | No.             | %    |
| mean ± SD                       | spectators      | 22              | 78%  |
| median                          | staff           | 5               | 18%  |
| range                           | by-standers     | 1               | 4%   |
| Sex                             | No.             | Time of patient visit | No. | % |
| male                            | before concert  | 10              | 36%  |
| female                          | during concert  | 18              | 64%  |

Fig. 1. Volume of patient load at a rock concert.

Fig. 2. Time of visit by fainting patients at a rock concert.
mass gatherings dem onstrate much higher suc cess rates than even the most ad vanced emer gency med i cal sys -

tems (EMS). A rock con cert is a mass gath er ing ac tiv -

ty of high med i cal use rate. It re quires a spec trum of

med i cal sup port that can deal with an in ci dent from a

cut hand to a car diac ar rest. The im por tance of pro -

viding defibrillators at the sta di um has been rec og nized

for about 30 years. It has been re ported that rock con -

certs had four times the med i cal use rate as bas ket ball

games and three times that of foot ball games. There

was a small but sta tis ti cally sig nif i cant in crease in pa -
tient vol ume with the in crease of crowd at con certs. The

mean pa tient vol ume of rock con certs re ported by

De Lorenzo et al was 9.8 PPTT. The me dian vol ume of the

pa tient load at rock con certs re ported by Grange et al

was 3.8 PPTT. The vol ume of the pa tient load at this

sum mer rock con cert was 5.6 PPTT, fall ing be -
tween the re ports made by De Lo renzo et al and by

Grange et al. In sim ilar ac tiv i ties held in Tai wan, the

pa tient load was com pa ra ble with that of other coun -

tries. How ever, the range of patient vol ume was

vari able. Be cause hun dreds fold of pa tient loads and di -
sas ters may oc cur, mass ca su al ties and di sas ter prep a -
ration must be con sid ered.

The fact that 36% of cases had oc curred be fore the

con cert started sug gested that med i cal teams should

pre pare their ser vices ear lier so that med i cal care

could be pro vided in time.

The common in juries/ill nesses re ported at the

rock con cert were trauma, head aches, faint ing, syn -

cope, and al co hol or drug re lated in ci dents. In our

study, faint ing spells, trau mas and head aches were

also com mon com plaints. Al co hol or drug re lated in -
cidents have not been in vesti gated. Lem pert and

Bauer have in ter viewed 40 girls who fainted, of whom

forty per cent re ported hav ing lost con scious ness. In

our study, three (23%) of 13 faint ing cases had con -
scious ness loss. The per cent age was slightly lower

than re port from Lem pert and Bauer. In our study,

12 out of 13 faint ing cases were fe male. The in ci -
dence of faint ing spells seemed to be higher in fe males.

The risk fac tors of faint ing spells in cluded clu ding sleep

less ness, fast ing, a long pe riod of stand ing, hy per ven ti -
lation, scream ing, ex ter nal com press ion of the tho rax by

the push ing masses and stand ing next to the stage where

squeezing is maximal. There fore, the sug gested

guide lines for pre ven tion in clude sleep ing, eat ing,

sit ting, keep ing cool, and stay ing out of the crowd.

More than half of the cases seen in this summer

rock con cert re quired ALS. At the same time, the po -
tential for a ma jor in ci dent al ways ex ists. In Tai wan,

doc tors and nurses usu ally par tic i pated in the med i cal

care at the rock con certs. How ever, the prep a ra tion for

emer gency med i cal ser vices such as com mu ni ca tion,

ac ti va tion and re sponse sys tems, tri age cri te ria, train -
ing and se lec tion of med i cal per son nel, drills, de sign

for ma jor in ci dents and di sas ter, trans port cri te ria, dis -

tri bu tion of re ceiv ing hos pi tals, and in te gra tion into

lo cal EMS were, in gen er al, in ad e quate for most of the

events. From this study, we rec om mend that the level

care for events such as rock con certs should be set

up to in clude ad vanced life sup port. ALS teams with

ad e quate equip ment should also be ar ranged to pre -
vent de lay ing or miss ing the se vere cases. In con -
clu sion, by this pre lim i nary data, we found that the most

Table 2. Main problems of 28 patients at the rock concert

<table>
<thead>
<tr>
<th>Main problems</th>
<th>No.</th>
<th>%</th>
<th>ALS or BLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fainting</td>
<td>13</td>
<td>46%</td>
<td>ALS</td>
</tr>
<tr>
<td>Abrasion/laceration/blunt injury</td>
<td>6</td>
<td>21%</td>
<td>BLS</td>
</tr>
<tr>
<td>Painful red eye</td>
<td>3</td>
<td>11%</td>
<td>BLS</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>2</td>
<td>7%</td>
<td>ALS</td>
</tr>
<tr>
<td>Headaches</td>
<td>1</td>
<td>4%</td>
<td>BLS</td>
</tr>
<tr>
<td>Chest pain</td>
<td>1</td>
<td>4%</td>
<td>ALS</td>
</tr>
<tr>
<td>Nausea</td>
<td>1</td>
<td>4%</td>
<td>BLS</td>
</tr>
<tr>
<td>Upper respiratory infection</td>
<td>1</td>
<td>4%</td>
<td>BLS</td>
</tr>
<tr>
<td>Bee-stings</td>
<td>1</td>
<td>4%</td>
<td>ALS</td>
</tr>
</tbody>
</table>

*One fainting case had also lacerated wound; ALS = Advanced life support; BLS = Basic life support.
common problem at this summer rock concert in Taipei was fainting. More than half of the cases needed advanced life support. A well-designed EMS system is mandatory to provide services at these events.

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References

台北夏日搖滾演唱會病患特質

高偉峰  郭健中  張新  陳威龍  魏建華  黃獻白
顏鴻章  吳哲侃  慕珣  李建賢

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國立陽明大學  急診醫學科

背景  台灣雖然常舉辦大型演唱會，每年參與演唱會的歌迷超過百萬人，但在大型演唱會中，容易發生那些傷病，應如何規劃緊急醫療救護系統，未曾有相關文獻報告。

方法  於 1999 年夏季，在台北市針對兩場夜間露天演唱會，由預先受過訓練的急診醫師與護理人員參與可做高級心臟救命術的醫療服務，以預先設計的病患處置表格，記錄搜集病患資料，以瞭解演唱會時病患的病況、及緊急醫療救護需求，並同時予以積極治療，以保障歌迷及工作人員的安全。

結果  在 1999 年夏季，兩個晚上的演唱會，每天各接獲 14 位病患，共有病患 28 人，年齡由 13 歲到 40 歲，平均為 20.8 ± 6.4 歲，其中女性有 21 位。病患以現場歌迷為主佔有 22 位（79%），醫療使用率約佔現場兩天約有 50,000 位群眾之 0.056%。現場主要問題診斷為昏倒佔最多有 13 人（46%）。昏倒的 13 位病患中 12（92%）位為女性，其中有 3（23%）人有意識喪失。28 位病患中 12（43%）位病患被認為只需要可做基本救命術的成員（BLS）處理即可，16（57%）位病患則需要可做高級救命術（ALS）的醫療團隊照護才安全。

結論  根據國外的報告，大型熱門演唱會是著名高醫療使用率及容易發生失序的活動，國內演唱會也曾發生百餘人昏倒，40-50 位病患送醫的現象。從我們初步的資料看來，此次的大型熱門演唱會，最常見的病患也是昏倒而被抬至醫療站。超過一半的病患是屬於需要可做高級救命術的醫療團隊照護才安全。為確保歌迷及工作人員的安全，國內舉辦這樣大型的熱門演唱會，也宜有良好緊急醫療救護系統規劃，並有可做高級救命術的醫療團隊進駐。

關鍵詞  緊急醫療救護、大型活動、演唱會。