Diagnosis According to Time of Arrival at "The Great New York State Fair"

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NYSF: New York State Fair

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Abstract

Objective: To study the diagnoses of patients presenting to a medical facility within a mass-gathering public event, "The Great New York State Fair" (NYSF) based on chief complaints, diagnoses, and time of arrival. The goal of the study was to assess the need for increased staffing, services, or supplies during certain times of day for an event that gathers approximately 1 million patrons over a 12-day span. Patrons occupy the grounds between the hours of 10 AM and 11 PM, while workers and staff are on the grounds around the clock.

Method: Triage data gathered by trained medical students was collected from all of the patients seen during the 2009 NYSF from 12 AM to 11:59 PM. Triage information was categorized based on the nature of complaint, physician impression, and time of arrival to assess for trends in the distribution of common chief complaints and diagnoses at a mass-gathering medical care facility.

Results: The early hours of the NYSF were occupied mostly with treatment of minor first aid complaints, while later hours were occupied more commonly by orthopedic complaints. Insect stings were the most frequent complaint throughout the day.

Conclusion: Daytime and evening hours at the fair have a significant number of orthopedic diagnoses and may benefit from specific staff and equipment sufficient to handle these complaints. Stings and minor first aid injuries are also significant and may benefit from adequate stocking of the infirmary for such events. Major medical complaints, including cardiac and neurological complaints, did occur but were a minor part of the total patient population.

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Introduction

"The Great New York State Fair" (NYSF) is a 12-day event that has been in existence since 1841. Since its initiating year it has grown significantly and, to date, attracts around 1 million visitors to Syracuse, New York USA each year.[1] A large mass-gathering event, such as the state fair, requires medical care to be available on site. In Syracuse, this is staffed largely by faculty from the University Hospital. The infirmary on the fairgrounds sees on average 600 visits each year with a variety of complaints. The infirmary is staffed by a physician from 11 AM to 11 PM and a nurse from 10 AM to 10 PM.

The visits to the infirmary may be separated into visits that are seen before physician arrival or before the gates are opened to the public, those seen during daytime hours with a physician on duty, and those seen during main stage shows in the evening hours. Certain patterns may be seen that can help to predict the most likely diagnosis to come to the infirmary at certain times of day and help to make decisions about staffing and stocking supplies.

The authors of this study analyzed the data from the NYSF of 2009 to identify trends. A study of the literature showed several other studies that predicted the rates of each type of complaint and diagnosis, but no studies were found that analyzed this according to time of day.[2,3]

Methods

All of the patients seen at the infirmary were signed in with a preliminary triage sheet that was then further completed by infirmary staff and the overseeing physician. These reports were collected and retrospectively formed into a database. The chief complaint, diagnosis

and history of present illness were reviewed and patients' complaints were then categorized. These were further organized according to medical specialty, including Gastrointestinal, Cardiac, Endocrine, Infectious, Dermatology, Musculoskeletal, Neurology, Orthopedics, Ear/Nose/Throat, Pulmonary, and Ophthalmology. First aid was a separate category, including minor lacerations and bandages. Stings were listed separately, including any bee stings or bug bites. "Other" was a broad category that included anything that did not fall into the above listed areas, including allergy, anxiety, choking, dehydration, epistaxis, undiagnosed fatigue, foreign bodies, pregnancy related issues, falls, and syncope that could not be otherwise defined.

The complaints were analyzed according to time of day by the arrival on the triage forms. The day was separated into the hours before the arrival of medical staff, from 12 AM to 9:59 AM, daytime hours with the physician present, from 10 AM to 5:59 PM, and evening hours during the main stage concerts and post-concert, from 6 PM to 11:59 PM.

Results

Organizing the data according to time of day revealed certain trends (See Table 1). The early morning hours, from 12 AM to 9:59 AM, were most notable for minor first aid diagnoses and bee or bug stings. A total of 23 patients were seen. These were closely followed by diagnoses in the "other" categories, but there were no complaints of ophthalmologic, ear/nose/throat, or cardiac origin. Four patients (17% of the morning period) were seen with first aid complaints and four patients were seen with bee stings or bug bites. Three patients (13%) were seen with an orthopedic diagnosis, two patients (8.7%) with an abdominal diagnosis and two patients with a dermatological diagnosis.

During the daytime hours, from 10 AM to 5:59 PM, 353 patients were seen. Seventy of these patients (20% of daytime hours), had a diagnosis of orthopedic origin, that is sprain, strain, fracture, contusion, or abrasion. Stings were the next highest complaint/diagnosis with 17.7% of patients. This was followed by complaints of dermatological origin, which included burns, rashes, and other nonspecific diagnoses (n = 29 patients or 8.2%). This was followed by minor first aid in 20 patients. Of note, 88 patients were categorized into the "other" category. Twenty-four of these patients were undefined syncope (6.8%), 19 were dehydration (5.4%), 13 were falls (3.7%), and 10 were allergy related (2.8%).

Ninety-four patients (32% of all seen) presented during the evening hours from 6 PM to 11:59 PM. The most common diagnosis was related to orthopedic injury (32% of evening hour diagnoses). Stings were the next most common in 8.5% of patients. Six patients had minor first aid complaints, seven fell into the "other" category, and four were alcohol related diagnoses.

Diagnosis	Number	Percent of Total
12 AM to 10 AM		
First Aid	4	17
Orthopedic	3	13
Abdominal Pain	2	9
Dermatological/Rash	2	9
10 AM to 6 PM		
Orthopedic	70	20
Bee Stings	62	18
Dermatological/Rash	29	8
First Aid	20	6
Syncope	24	7
Dehydration	19	6
Allergy	10	3
6 PM to 12 AM		
Orthopedic	30	32
Stings	8	8.5
First Aid	6	6
Alcohol Intoxication	4	4

Table 1. Total Numbers and Percentages by Complaint and Time of Day

Discussion

The results of the data from this study show the following trends. A large number of orthopedic- related injuries and bee or bug stings were seen in the infirmary throughout the day, though largely these complaints were seen during the daytime hours. Minor first aid issues play an important role in those treated before medical staff is available in the infirmary.

The trends found in this study give a good idea of what is largely seen during certain hours of the day at the NYSF. This information may be useful to determine the staffing necessary for similar events. It appears that the early morning hours do not require a significant amount of medical staffing. Minor first aid complaints may be handled quickly by nursing staff or mid-level practitioners. On the other hand, the evening hours during the main stage concerts may require additional services to care for the larger number of patients seen and the larger number of orthopedic related injuries that require increased medical training for treatment. These same analyses can be useful for stocking supplies or equipment that would be necessary during these specific hours for these specific and common complaints.

Similar studies of mass-gathering medicine have been conducted. Results find a high incidence of minor first aid complaints, including requests for band aids and requests for analgesia, much like this study found. These studies, however, did not differentiate time of day.[2,3]

It was noted that first aid and stings were the most commonly seen diagnoses from 12 AM to 9:59 AM. There was only a one or two patient difference between these diagnoses and other diagnoses. This minor difference could vary largely from day to day and year to year. The daytime and evening hours, on the other hand, had a very large number of orthopedic injuries with a 20-40 patient difference when compared with the next most common diagnosis. Since the number of insect stings, most notably by bees and wasps, is so prevalent, the research team is considering a proactive interventional study to reduce the number of complaints of this type.

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The patients seen before 10 AM consist mainly of those who are working at the fair and generally do not include visitors. Those who were seen during the daytime hours and the evening hours were not separated into those who were fair workers and those who were fair visitors, which may have some impact on the data and could be further studied.

Ten hours of data was collected in the morning, eight hours in the afternoon, and six hours in the evening. Adjusting the number of hours measured may have some impact on the data, but organizing the data according to the events of the fair (before the gates opened, during the daytime, and during the evening concert) appeared most logical.

In the evening hours, more alcohol-related diagnoses were expected, and it is unclear if these were not reported by patients or not considered related to the diagnoses and thus, not recorded.

Further exploration of this data is warranted. Given the large number of orthopedic injuries, it should be determined whether it would be useful to have a portable X-ray machine or to have staffing with significant orthopedic training on site. It may also be useful to separate patients based on workers at the fair versus visitors, or according to adult versus pediatric.

Conclusion

This analysis showed the significance of orthopedic injuries during the daytime and evening hours at the state fair. Sting injuries and first aid injuries also played an important role, but may have been more important during the morning hours among the workers at the state fair. This data could inform analysis of the need for more staffing and/or differential stocking of the infirmary.

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