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Organization of medical support measures with a massive concentration of people in the city

Abstract: The article describes the structure and treatment of victims in events with a massive concentration of people in Moscow over the past 5 years (2011–2015). The main tasks and conditions of medical support for events of various types and scale in Moscow are presented, taking into account the parameters necessary for predicting the number of participants and the possible number of victims.

Keywords: public events, emergency medical service, medical forces.

Holding of events, associated with massive concentration of people, requires compliance with safety measures; and organization of medical support for them has a number of features, what is confirmed by recent publications [1; 2; 3; 4; 5].

Among regional characteristics of Moscow it should be noted that in the Service for Disaster Medicine the large-scale city public events, ranging from 16,8 to 19,2%, are regarded as "risk events" and require a serious organizational elaboration and introduction of significant medical forces.

Upon receipt of the application, a preliminary planning of medical support is performed, considering the set of parameters that characterize object, type, scale of the event, contingent of participants and duration with a mandatory cartographic scheme for allocation of medical forces.

In the Scientific-Practical Center of Emergency Medical Care of Department of Health of the city of Moscow — Territorial Center for Disaster Medicine (TCDM) — retrospective analysis of city events with massive concentration of people, including 5–100 thousand participants or more, was performed.

The structure of main events with massive concentration of people in 2011–2015 is presented in figure 1.

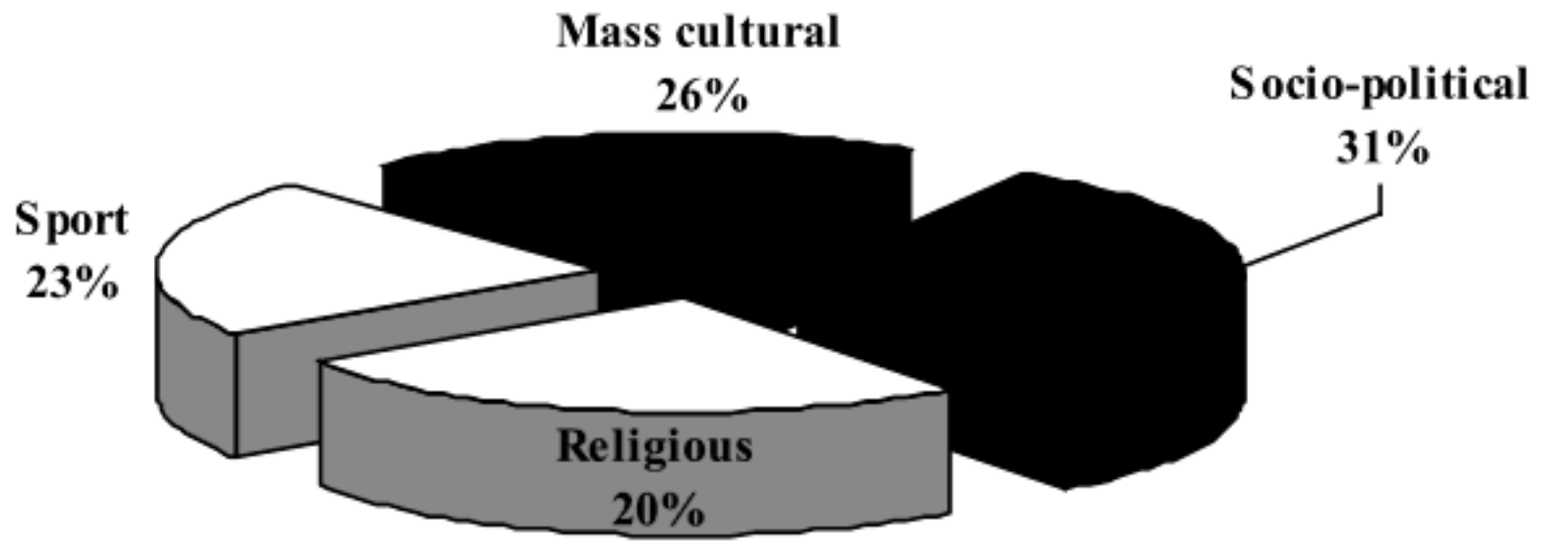

Figure 1. The structure of main events with massive concentration of people

As can be seen from the data presented in the structure of massive events, the first place is taken by socio-political events, the second place belongs to mass cultural events, the third place — sport events, which on average make up 23%, however, they are the most massive (up to 80,000 people attend football matches) and are regarded as risks for emergence of disorders among fans.

According to assessment of events with sanitary losses, the structure of events has not changed in scale for the last five years. The most numerous are events with 1–5 sanitary losses (on average – 76.2%), events with 6–10 victims amount to 10.7%, with 11–50 victims – 11.1%, and events with more than 50 sanitary losses – 2%.

The structure of results relating to treatment of victims during events with massive concentration of people is reflected in figure 2.

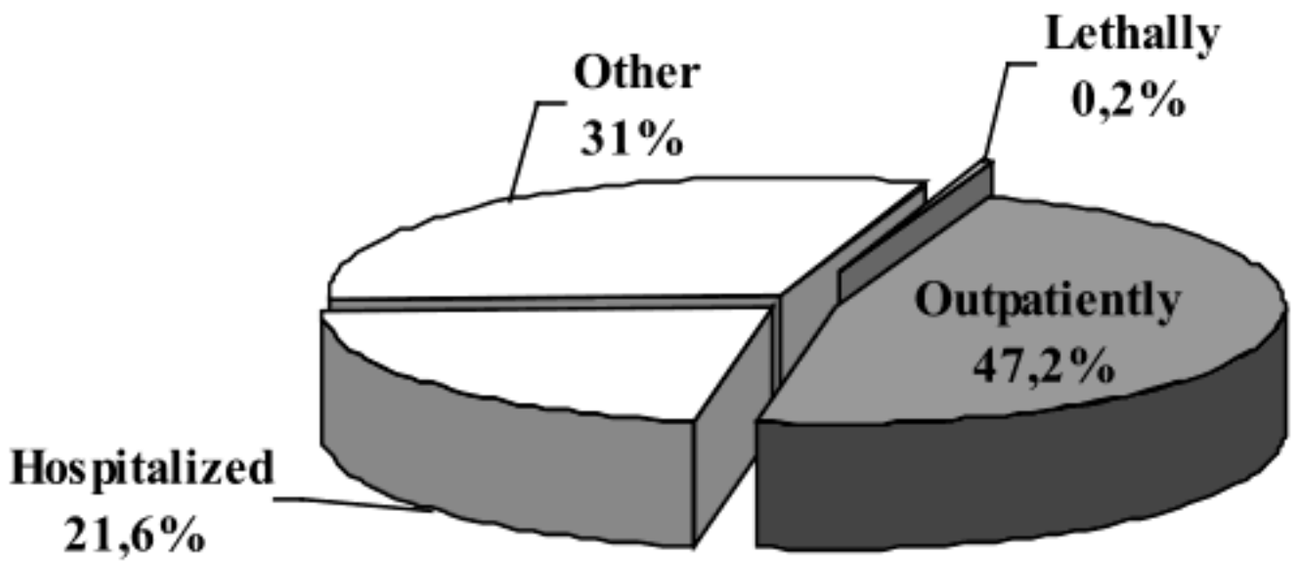

Figure 2. Results relating to treatment of victims during events with massive concentration of people

The considerable part of victims (47.2%) received medical treatment at the scene, proportion of hospitalized patients amounted to 21.6%, and victims who died at the scene of the accident — 0.2%.

As long-term experience has shown, events including a significant number of people refer to "risk events". Every event with massive concentration of people is unique. However, analysis of previous experience allows to outline main directions, the specification of which makes considerable contribution to the rational planning of medical forces and resources, as well as to the risk prediction.

In **organization of medical support** for the above-mentioned activities, the main tasks are as follows: provision of rapid access to victims, fulfillment of medical sorting, stabilization of the victims' status, if necessary emergency hospitalization and provision of medical aid for the slightly injured patients at the scene.

The **common condition** for all events is provision of the unhindered passage for medical personnel to any point of the object and corridors for evacuation of victims, as well as to the approach roads for ambulance cars, what is coordinated with organizers and law enforcement agencies at the planning stage.

Solution of the tasks relating to medical support for mass events involves the units of emergency medical service: emergency medical service, medical nursing teams (MNT) of prevention-and-treatment facilities and MNT of sports medicine. The Territorial Centre for Disaster Medicine is the sole institution in the sphere of urban healthcare service, which has all specified services under its operational control. TCDM has its own teams of emergency response, transport, system of collecting and transmitting information.

Rational medical support of mass events requires the advance planning of medical forces and resources. The mandatory condition for initial planning of medical forces and for organization of effective medical support of mass events is considered to be the availability

of reliable information about complex range of factors as described below.

Variable parameters necessary for predicting the number of audience and the number of possible victims:

– type of the event and venue;

– scale of the event;

– contingent of participants;

– duration of the event and main content;

– stationary events or activities that involve movements of participants;

– density and velocity of mass movement;

– consumption of alcohol and drugs;

– types of expected damage or diseases;

– weather conditions;

– availability of medical care services;

– terrain relief in the venue;

– characteristics of the object.

It is impossible to analytically assess the impact of all mentioned factors in relation to volume and technology of medical support, but each of these parameters and their combination represent the predicted criteria in evaluation of possible demand for health care and its types.

The characteristics of each of the events dictate their own options for organization of medical support. Following general principles of organization of medical support for mass events we have proposed the differentiated system of efficient medical support planning for mass events of various type and scale with relation to the abovementioned chief factors. TCDM's experience in medical support of events shows that methods of medical care organization indoors and outdoors, in stadiums and in streets have significant differences.

In planning the medical support for events, which have more than 5 thousand participants and take place ***in open area***, as an obligatory provision is regarded to be organization of 2–3 stationary medical aid stations on sanitary transport or in ambulance bus with 1–2 TCDM's doctors on duty and 2–4 medical-and-nursing teams of the prevention-and-treatment facility. All medical nursing teams have to be provided with equipments according to standard outfit for work at events with massive concentration of people. During movements of participant masses, buses are used as mobile units. Medical aid stations are supplied with conventional signs, which can be visible from afar.

Indoors the medical stations work in premises, allocated in advance by the event organizers, with involvement of medical nursing teams and employees of medical aid stations of the venue for provision of medical care. To facilitate evacuation, medical aid stations are located close to service exits. Sanitary transport, which is ready for evacuation of victims, is located near service entrances.

It is most difficult to organize large-scale complex events, the program of which involves a simultaneous holding of various types of events with a large concentration of people indoors and outdoors, and movements of participants.

For rational and efficient use of medical forces and recourses during organization of medical support for mass events, the computer program has been created that allows to display on fragments of Moscow map the possible alignment of forces and recourses of emergency medical service during planning of medical support measures for mass events and during their holding.

Thus, we should emphasize the importance of effective collaboration between all services, which are involved in holding of events with a massive concentration of people and which require from medical support organizers the understanding of work principles of law enforcement agencies, security forces, technical and other services, as well as certain "flexibility" and willingness to search for optimal ways of task performance in real-life situation. No less significant is a clear preventive viewing of not only the medical support structure in general, but also the work area for each employee.

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