

KAMEDO Report 90: Terrorist Attacks in Madrid, Spain, 2004

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KAMEDO = Swedish Disaster Medicine
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Abstract

This is a descriptive study of the medical responses to the bombings by terrorists in Madrid on 11 March 2004. The nature of the event, the human damage, and the responses are described. It describes the: (1) nature and operations associated with the alarm; (2) assignment of responding units and personnel; (3) establishment and operations of casualty collection points; (4) medical transport and distribution of injured victims; (5) prioritization and command; (6) hospital care; (7) psychosocial care; (8) identification of the dead; and (9) police investigation and actions. Each of these descriptions is discussed in terms of what currently is known and the implications for future planning, preparedness, and response.

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Terrorist Attack of 11 March 2004

Events

A total of 10 bombs placed on four different trains were detonated during the terrorist attack in Madrid on 11 March 2004. Fourteen explosive devices had been prepared and put into rucksacks and sports bags that were placed on trains at the Acalá de Henares station located east of Madrid. Each bomb contained explosive material and a detonator that was connected to the alarm function of a mobile telephone.

The first bomb exploded at 07:39 hours (h), after which nine additional bombs were detonated within a period of a few minutes. Four of the bombs never exploded. The locations that were attacked included Atocha central station, the stations at Santa Eugenia and El Pozo, and the area around Téllez station. The trains that were attacked at Téllez and El Pozo each were estimated to have between 1,000 and 1,800 passengers onboard.

This incident is the most serious that has occurred in a European country during peacetime. A total of 191 people were killed, and >1,500 injured. The magnitude of the attack called for the mobilization of resources from several municipalities in the region. This resulted in activation of both the regional and national command organizations—something that previously has never happened.

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Keywords: alarm; ambulance; explosive device; Madrid; psychosocial support; Samur; Summa 1-1-2; terrorist attack; triage system

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Alarm

The first call concerning the attack at Atocha central station came in to the Madrid Emergency Service Center 1-1-2 at 07:39 h on 11 March. While the person placing the call was being questioned, the alarm was forwarded to the Emergency Service Centers for the two ambulance organizations in Madrid—Summa 1-1-2 and Samur. The alarm was forwarded to the police and the emergency and rescue service as well as to other concerned authorities. As calls were received concerning the other attack locations, this information also was forwarded. At about 08:30 h, an Emergency Response Regional Command Center was set up in Madrid. At about 10:00 h, the Spanish government established coordination at the national level.

During the first 16 hours, >22,000 incoming calls were registered at the Madrid Emergency Service Center 1-1-2 in connection with the attacks. At no time was there a shortage of personnel at the Center since the incidents occurred at the same time as a shift change, and the shift that was going off duty was ordered to remain. About two-thirds of the available switchboard capacity of the Center was engaged. Madrid 1-1-2 was used as an information center during the day, meaning that authorities and relatives could call there for information about which of the hospitals to which the victims had been transferred.

Prehospital Medical Care

The first ambulance arrived at Atocha seven minutes after the alarm was raised, and the first critically injured patient was transported from there 23 minutes later, following the arrival of the Samur ambulance organization. Prior to evacuation by ambulances, a large number of victims had taken themselves to hospitals in taxis or private vehicles. Within 30 minutes of the first alarm, hospital tents were set up as collection points at all four incident sites. In addition, a sports hall in T elvez was used for this purpose. At least one of the locations had a tent set up in direct proximity to a demolished railway carriage, placing it within the risk zone for possible further explosions.

There was a rapid flow-through of victims at the collection points. Despite this, advanced treatment was utilized at all of them, including gaining intravenous access, endotracheal intubation, and pleural drainage. Life-threatening hemorrhaging was also stopped by applying pressure bandages and cut-off bandages.

Medical Transport and Distribution

All of the injured had been moved away from the incident sites by 10:17 h—two hours and 38 minutes after the first explosion. Medical transport officers at the sites attempted to distribute “their” patients evenly throughout Madrid’s emergency hospitals. However, there was no distribution system or an updating of the situations at the various hospitals available at the incident sites.

In total, 927 injured persons, 165 of whom were judged to be seriously wounded, were transported by ambulance to at least 15 different hospitals and clinics in Madrid. It was not apparent until later that the distribution among the hospitals had been rather uneven.

Prioritization and Command

No form of triage system by color marking or similar methods for prioritization of the victims was used, either at the incident sites or the casualty collection points, despite the fact that the equipment was readily available. It was felt that it was “obvious who had received light, serious, or critical injury to the extent that an indication system was not necessary”.

The prehospital care operation was organized through cooperation between Samur and Summa 1-1-2. Both organizations are among the best qualified ambulance organizations in the world, in terms of both availability of advanced technology and qualified personnel. On-site command was executed by Samur, the police, and the fire and rescue service. Personnel at both Summa 1-1-2 and Samur felt that they alone had led and coordinated the medical operations in the affected areas. According to the regulations, the command of medical care operations lay with Samur.

Hospital Care

Directly after the alarm, the hospital management at Gregorio Mara on—one of the largest hospitals in Madrid and also one of the hospitals that received the most patients—decided to postpone all the operations planned for that day. This immediately made 22 operating rooms available. Following this, beds were made available by releasing patients. Within two hours, 161 beds were made available, and within six hours, 438 beds were available. Most of the intensive care patients could be moved to a lower care intensity level—intermediate care or post-operation care.

The emergency ward was organized in such a way that patients were categorized at the ambulance entrance. The most serious cases were taken to the makeshift trauma room. From there, they were taken in for surgical operations, to an intensive care unit, or to a ward that was opened especially for the emergency.

Relatives and Confidentiality

All of the hospitals were placed under extreme pressure from relatives. A few hours after the attacks, >600 relatives had gathered at the accident and emergency ward at Gregorio Mara on Hospital. They were shown to a large assembly hall where a list of injured patients was read aloud every 30 minutes. This marked a deliberate decision to override Spanish law concerning confidentiality. This decision initially was made by the affected hospitals separately, but later was sanctioned at the regional and then national level.

A problem that soon affected the hospitals was that both the land line and mobile phone systems became overloaded and unserviceable. This caused difficulties in terms of information distribution both internally and externally.

Psychosocial Care

The psychosocial care of the injured and their relatives at Gregorio Mara on Hospital had not been anticipated in the disaster plans. The hospital management appointed a senior, experienced psychologist to take responsibility for this aspect. The concept that “the first priority was to save lives, but then to apply all possible resources to protect and restore mental health”. According to the guidelines given in crisis management literature, one should gather families

and separate them from other relatives. However, this was not possible in this situation, since personnel had altogether too many relatives to attend to.

Those responsible for psychosocial care understood the significance of providing accurate information to the relatives. For this reason, the names of the injured and where they were being cared for was read aloud. This information was updated every half hour. In order for the information to be as accurate as possible, it was first checked by a Control Group before being issued.

After two days, a special Website was set up showing a list of injured persons. The Ministry of the Interior took responsibility for the Website and the decision to publicize the list of patients. A list of those who had died was not made public.

The hospitals also worked to provide accurate information to the media, in order to avoid the spread of rumors.

Psychosocial Support in the Aftermath

Children and young people who were involved appeared not to be in great need of psychological support initially, but when a mobile unit actively started visiting schools, the number of visits rose significantly. These visits initially were discouraged by headmasters and teachers, who felt that there was no need for such support in their particular school. In addition to these visits, two afternoon units for involved children were established in two of the most affected areas; these still were open a year after the event.

Relief and debriefing of operative personnel was arranged partly through the medical service's own channels and partly through a strengthening of psychiatric care resources at healthcare centers.

The Office for Mental Health offered to provide assistance for police and fire and rescue service personnel. Both of these authorities, however, declined the offer for the reason that they would provide psychosocial relief using their own channels. Representatives of the Office felt that the explanation given by the management of the police and fire and rescue services reflected a concern that external help with crisis management would undermine morale in the units and lead to an increase in sick-leave among staff.

Identification of the Dead

The bodies and remains of the dead were taken to Ifema, which is Madrid's exhibition area. Personnel from the Office for Mental Health assumed the task of caring for the relatives of the dead. Between 11 and 13 March, a team of psychiatrists, psychologists, social workers, and secretaries worked tirelessly to support waiting relatives. This approach contrasted with the Summa 1-1-2 approach, where organized voluntary psychologists worked from 11 to 22 March.

Identification of the dead went very quickly; after just 24 hours, 155 of the total 191 bodies had been identified and the relatives notified. On 13 March, the identification work was moved from the exhibition area to a cemetery with a cold room. Here, psychosocial help also was available to relatives. By 15 March all of the dead had been identified. For 37 of the fatalities, DNA analysis was required in order to confirm identification.

Police Investigation

The police investigation after the attack led to seven of the suspected terrorists being localized in a flat in the Leganés district on 03 April. Police units surrounded the property and the neighboring inhabitants were evacuated. Shots were fired during the break-in, after which the terrorists blew up both themselves and the flat. Continued police work during the following months resulted in the arrest of more than 20 other suspects, the majority from Morocco.

Observer's Experiences and Conclusions

Prehospital Care

Ambulance Organizations—Emergency prehospital activities in Madrid are divided between two organizations—Summa 1-1-2 and Samur. Less demanding medical transport also is provided by other ambulance organizations, for example, the Red Cross. Summa 1-1-2 is operational in the entire Madrid region, whereas Samur only operates within the city of Madrid. Consequently, there are two emergency ambulance organizations operating in central Madrid, of which Summa 1-1-2 is responsible for emergency calls within private housing areas and Samur is responsible for incidents occurring outdoors and in some official buildings.

The allocation of emergency services depending on whether the incident has occurred in private housing or a public place appears rather strange. The representatives for the two organizations, however, saw no problem in this. There is apparently a degree of rivalry between the organizations, which was made clear during the actual event, in that both organizations felt that they alone had led and coordinated the healthcare operations at the incident sites. Summa 1-1-2 has at its disposal, 70 ambulances and emergency vehicles, as well as two helicopters, while Samur has about 130 ambulances, emergency vehicles, and motorcycles. Both organizations also have their own staff vehicles and special disaster vehicles. Samur has 30 emergency vehicles staffed with doctors. These are dispatched along with an ambulance in order to follow and assess the work of the ambulance crew in accordance with a special model. Directly after the response, the ambulance crew is graded for its performance, and feedback on the response is provided.

Regulations stipulate that responsibility for the healthcare operations lay with Samur. Therefore, the doctors who were sent out by Summa 1-1-2 were assigned no managerial roles by Samur as they were working within an organization that was not integrated with Samur. Instead, these doctors were allocated tasks concerning individual patients.

The importance of recognizing and adhering to the framework that sets the limits between cooperating organizations was made very apparent. This applies more closely to cooperation between the fire and rescue services, and the police and the medical services; but it also could apply to the Civil Aviation Administration, Maritime Administration and the Mountain Rescue Service when incidents occur within their respective areas of responsibility.

The total resources of Madrid are significant, considering the city's population. It is also interesting to note the primary purpose of the emergency vehicles manned with doctors, namely to assess the work of the ambulance crew.

This resource is an excellent way of increasing the quality of ambulance responses, and it is also an extra resource should it be required.

Response Plans and Alarms

The response plan, Platercam, is based on the law regulating civil protection and emergency response. This law defines the areas of responsibility of the different authorities including the police, emergency and rescue service, and medical services. All responses begin at a local level (Level 1). If the incident is of a scale requiring the mobilization of resources from several neighboring municipalities, a regional command is set up (Level 2), based at the Madrid 1-1-2 center. The highest level is Level 3, which is national. This level involves the Ministry of the Interior and the establishment of a National Crisis Cabinet to support the affected region.

At about 08:30 h, just under an hour after the explosions, Madrid 1-1-2 took the initiative to set up a regional command, i.e., Level 2, in Platercam. Later, Level 3 was activated by the Spanish government.

The Platercam response plan enables rapid intervention and take-over of command at a national level. Other countries should consider establishing a model for a similar plan, i.e., for a rapid increase in preparedness and a take-over of the command of emergency and medical responses at the optimal level, based on the characteristics and scope of the incident.

A direct transfer of the alarm made it easy to rapidly forward the alarm to where it was required. Emergency Center operators hold a key position in terms of the initial assessment and alarm in a serious situation. Therefore, they should be trained for such situations.

Collection Points and Evacuation

The hectic evacuation of the injured using various forms of transport resulted in a swift influx of the injured to the hospitals, with the least injured often arriving first. This is a well-known phenomenon when incidents occur close to hospitals, but it is something that often is disregarded when planning or training for major disasters. At the same time, it is acknowledged that efforts should be made to avoid this phenomenon as it creates disorder. However, the phenomenon is difficult if not impossible to influence. Instead, it would, be better to see it as an asset rather than an impediment in situations in which the medical transport capacity is limited in relation to the number of injuries. It is important that the personnel at the hospital are aware of the phenomenon and plan their routines accordingly. In practice, this means that the hospital emergency reception quickly receives a large number of wounded that have not been diagnosed, and consequently, have not been prioritized. Because of this, the Accident and Emergency Wards become a part of the incident site.

According to some disaster medicine models, the first priority in urban environments is to move the wounded to a hospital as quickly as possible, in line with the scoop and run principle. In Madrid, however, with a larger number of ambulances and close proximity of many large hospitals, the decision was made to set up collection points and to stabilize patients at the sites.

Both ambulance organizations consider that success lies in stabilizing critically injured patients prior to transportation. In this instance, they believe this process was directly life-saving in many cases, in addition to relieving the pressure on the emergency wards. Such a strategy is based on the assumption that the stabilization process, with the obvious increase in time taken to reach the hospital, can take place without increasing the risk of death or disability. This assumption never has been substantiated. It is the opinion of the observers that collection points with protection and warmth always should be used for major disasters in remote areas with few ambulances and long transportation distances. Perhaps, there also is good reason to reconsider the scoop-and-run doctrine for highly populated areas in cases involving many seriously injured patients. Of course, the time factor is critical in both situations, i.e., how long it takes to set up a tent or gain access to a building. Each separate case involving injury requires an assessment of the response tactics at an early stage that is based on the prevailing conditions.

Prioritization and Distribution

Triage marking was not used in Madrid, despite the fact that the equipment was readily available. It was judged to be sufficiently obvious how seriously injured people were.

No form of distribution key or updating of the capacity situations at the hospitals was available at the incident sites. There are at least eight hospitals in Madrid with large emergency care capacities, and thus, each medical transport officer tried to distribute "their" patients evenly to these. In total, 927 injured persons, 165 of whom were judged to be seriously wounded, were taken to hospital by ambulance. However, not all the injuries were registered. There also are reports of people with slight injuries being referred directly to healthcare centers by the hospital emergency receptions, and some patients with minor injuries were treated without being registered. Consequently, the picture of the number of injuries is not accurate.

Within many countries' disaster medicine protocol, training is performed on a prioritization basis, and triage marking is included as a natural part of this. In Madrid, there were no special disaster journals or injury cards, instead, ambulance journals made of thin paper with a carbon function were used. The weather was favorable, but had it been raining or snowing, this would not have worked. Triage and triage marking such as injury cards should continue to be used as support for fast and appropriate care and as a part of the quality system for use of medication during disaster training.

A common system for the distribution of the injured to the hospitals was never implemented. Despite the fact that a regional command was established quickly at 08:30 h, three of the four incident sites were more or less evacuated before the command function was up and running 10:00 h. Shortcomings in the distribution of the injured to the various hospitals were compensated for largely by the huge hospital capacity in Madrid and the fact that the hospitals were warned at such an early stage. But, the distribution of patients between the different hospitals was not optimal. Spontaneous evacuation of patients, in combination with

an intense flow of patients to the closest large hospitals meant that the load placed on the key functions at the hospitals varied by the minute.

In practice, the hospitals lacked appropriate tools for describing and reporting their load, something that would have facilitated a more even distribution. In this situation of high loading, the staff abandoned the IT-system normally employed for reporting, among other things, the number of beds available. This indicates that the system was difficult to use and not suitable for a MCI situation.

Conditions are the same in other modern cities, and it is probable that if a similar situation occurred in a large city, the outcome would be the same as in Madrid.

Hospital Care—Leadership, Prioritization, and Communication

The hospitals were managed by those normally responsible, who received no information directly from the incident sites other than via the patients and ambulance personnel. During the most intense period, about 120 patients arrived per hour, many of these were critically injured and some were intubated. Despite this, there never was a feeling of shortage of either places or personnel at either of the two hospitals that admitted the majority of patients. Management of psychological care had not been planned in advance, but various solutions developed during the course of events. An information support system was not available at first, but was developed throughout the day, which, among other things, involved some conscious departures from the laws concerning confidentiality.

The two hospitals that were visited in this study received many injured persons who had arrived via taxi, police car, or private vehicle. These were not diagnosed by healthcare personnel at the incident sites and consequently triage functions were established at the entrances to the hospitals. Those who could walk were shown to a waiting room, while those on stretchers were taken directly to wards. Some triage markers were never used, with the explanation that “we didn’t have enough forms”.

Another difficulty at the hospital was the inability to transfer information. Communication was a problem, since both the mobile and landline phone systems collapsed both internally and externally due to overloading.

It is interesting that the hospitals were managed by their normal management personnel; in extreme situations, it is common to set up a special management group. It is also interesting that management of psychological care was not planned or trained for in advance, that no information system was in place, and that conscious departures were made from the laws concerning confidentiality. This illustrates the importance of the hospital management being familiar with their roles, that psychological care is prepared, and that an information support system is available.

Both the triage marking of patients arriving at the hospital emergency reception, as well as the inability to transfer information within the hospital via normal and mobile phones, are difficulties likely to be incurred elsewhere in the event of such extreme circumstances. Therefore, it is particularly important that these aspects are taken into account in disaster plans.

Psychosocial Care, Confidentiality, and Debriefing

The psychosocial support focused on three groups: (1) all those affected; (2) children and young people affected; and (3) personnel who worked with the injured and the dead. All those affected could call a special number if they required help or support. The call center was staffed by psychiatrists and psychologists and was open until the end of June 2004. Thirty-six call lines were available in addition to those normally functioning within Madrid’s mental health organization.

The disaster plans were followed, the emergency ward resources were strengthened, surgical operations were postponed, and the triage function was activated at both hospitals. At Gregorio Marañón Hospital, the psychological aspect had not been considered in the disaster plan. Despite this, the decision to solve the care of relatives by gathering them in a large assembly hall was reached quickly. This initiative was the result of one person’s decisiveness, and should not be taken as justification for not preparing for the problem of caring for the relatives of victims in extreme situations.

The confidentiality aspect with regard to issuing information proved to be problematic; laws concerning confidentiality were not followed, and most likely the problems surrounding both suitable locations for relatives and the need for information were underestimated.

It is crucial that psychological personnel are trained in disaster management and that premises and a model for issuing information to relatives are taken into account in the disaster plans. It also is important to consider how to distribute accurate information should the phone systems become overloaded. Focused support for the most seriously affected groups should be planned, and special attention paid to children and young people, bearing in mind the experiences gained from Madrid. The care of operative personnel often is neglected, and if some groups see the need for help as a weakness as opposed to a need, then this should also be considered.

Identification

The identification process was extremely quick and effective. In disasters involving many dead, especially in hot climates, this work can become very complicated. This was clearly demonstrated during the Tsunami disaster in Southeast Asia in 2004. This aspect should be taken into account in disaster plans.

The Nature of Terrorism

On 11 March, 10 bombs were detonated on four different trains. Four bombs never exploded. One reason for this was that the timer was set 12 hours too late. The police collected a bag containing one of the four unexploded bombs and took it to a police station without realizing what the contents were—10 kg of explosives and a detonator. In addition to the explosive device, the bag held a large amount of metal fragments, including nails, the purpose of which was to maximize injury to passengers close to the bombs.

The main purpose of a terrorist attack is to strike terror into the population and paralyze the society that has been targeted. For this reason, terrorist bombings often are targeted at locations where many people are gathered.

Experience has shown that suicide bombings, i.e., bombings carried out by people carrying a bomb on themselves, are the most difficult to protect oneself against. Furthermore, the explosive devices often are constructed to cause maximum injury to people.

The emergency care of physical injuries does not depend on whether the injury has been caused by an accident or a terrorist attack. However, there is every reason for manage-

ment to pay extra attention to the security of personnel in the case of a terrorist attack. The work should be managed keeping in mind the risk of further explosions and the collapse of buildings. Often, there is a lack of recognition within cities of the possibility of becoming the target of a terrorist attack, and that such could be planned to first detonate one bomb to draw in emergency service personnel and then set off additional bombs to cause a maximum amount of damage to the various emergency service organizations.