



Deliberate mass casualty incidents - a perspective from Spain

There is a multiplicity of medical care protocols in intentional mass casualty events, writes **Juan José Pajuelo**. But the optimal co-ordination among – and the safety of – first responders, still seems to be somewhat elusive

Madrid, March 11, 2004, 07:20hrs: “After a deafening sound, surprised and incredulous looks, I begin to hear cries, moaning and screams. To my left, a man of indeterminate age helps to remove the extinguisher foam covering the faces and mouths of other passengers struggling to breathe. I stand up heavily and finally I am able to avoid bodies and metal debris to reach the rail tracks and join a crowd that shouts and wanders into an unknown destiny...” This introductory paragraph is based on actual events during the Madrid bombings that injured more than 2,000 people and caused 193 fatalities.

Terrorism is not new in Spain or the rest of the world. It is not my intention to review terrorist attacks of the last decades in depth, but to highlight the lessons learned so that when we suffer the next attack, it can be managed in the best possible way. Or at least we won't repeat mistakes, especially when it comes to caring for victims.

‘Lone wolf’, ‘active shooter’, ‘running amok’ – different profiles and terminology abound when talking about attacks; the common intent is to cause the largest number of victims, often using low cost technology such as vehicles, light weapons and drones.

Here, we must define a Multiple Casualty Incident (MCI). Such an event is officially described by the SAMUR-PC of Madrid as an incident that is: “Characterised by presenting in its origins a disproportion between resources and necessities, so an extraordinary answer is required, with the goal of optimising the existing resources, preserving a capacity of response for subsequent events.” The New England Council for EMS defines an MCI as a: “Situation in which the emergency services are not able to control the situation within 15 minutes.” FEMA defines an MCI as an: “Incident in which the number of deaths is elevated enough to saturate the

Co-ordination across all echelons of emergency services is essential during mass casualty incidents

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resources of the local medical services.” Finally, the World Health Organisation defines an MCI as: “An incident that generates more patients at one time than locally available resources can manage using routine standard operation procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance.”

The response to deliberately caused incidents has many similarities with that of a non-deliberate MCI (Table 1) but there are also two clear and essential differences:

- The need for armed police staff to arrive as soon as possible to neutralise or isolate the threat, thereby minimising the number of victims; and
- Classification of assistance in ‘phases’ according to the threat level. This terminology seems better adapted than the concept of ‘zones’, as it allows dynamic successes, with multiple focuses and the understanding that there may be potential further attacks or attackers.

Training approaches and operational plans, based on statistics from different studies on the causes of avoidable deaths, include a study produced after ten years of combat in Iraq and Afghanistan, published by Eastridge and Cols. In *Death on the battlefield (2001-2011): Implications for the future of combat casualty care*, one of the conclusions is that deaths were produced by: haemorrhage (90.9 per cent), in particular caused by trauma to the inner thorax (67.3 per cent) and in joints (19.2 per cent), followed by a smaller number of traumas to extremities (13.5 per cent).

Analysis of different active shooter events and terrorist attacks involving explosives and firearms leads us to the conclusion – even if the evidence is still somewhat weak – that they cause different injuries to those seen in combat environments. These differences include:

- Military staff with bulletproof vest and helmet versus citizens without such protection; and
- Young personnel with a good compensatory index versus victims from different age groups and/or with comorbidities.

A controversial article from Smith, Sapiro and Sarani, members of the Committee for Tactical Emergency Casualty Care (C-TECC) entitled *The profile of wounding in civilian public mass shooting*

fatalities, concludes that potentially avoidable causes of death in comparison with those produced in combat are fewer and from different aetiology. The main avoidable causes of death in a civilian environment are down to thoracic injury, and the development of a secondary tension pneumothorax, in contrast to the massive haemorrhages in extremities that are seen in combat situations.

Although studies on attacks using vehicles do not make reference to the concept of ‘preventable deaths’, it can be extracted from their conclusions that most of the victims die because of brain trauma and that an important number of fractures in inferior and superior limbs and face occur. Internal aortic and splenic haemorrhages are also seen, albeit in smaller numbers.

Returning to the concept of ‘avoidable deaths’, the diverse terminology in different studies makes the data incomparable and it is notable that an agreement between the authors cannot be made; this fact is mentioned in *A Call for Consensus on Methodology and Terminology to Improve Comparability in the Study of Preventable Prehospital Trauma Deaths: A Systematic Literature Review*.

Heterogeneity of research

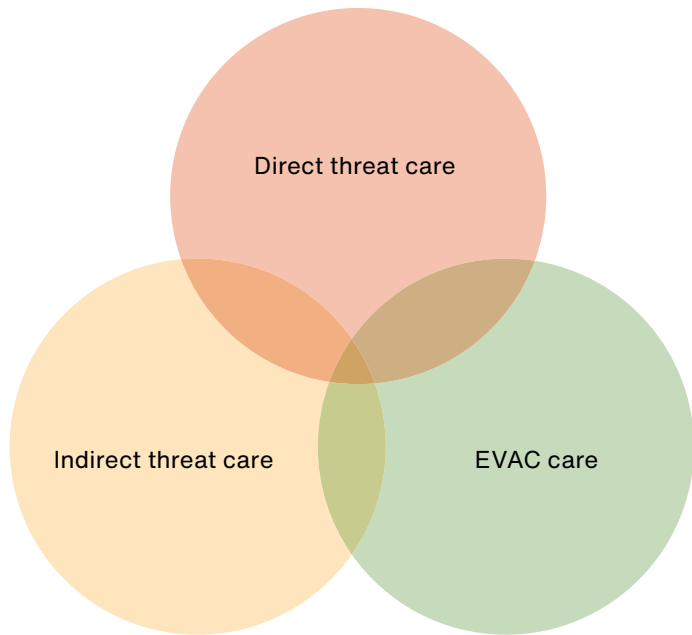
Another study performed by Janak *et al*, *Comparison of Military and Civilian Methods for Determining Potentially Preventable Deaths: A Systematic Review*, also outlines the inconsistency of definitions, incompatibility of criteria and heterogeneity of research methods. This indicates the need for a clear definition of the concept of preventable deaths, which will improve intervention approaches and the general outcome in victim management.

An interesting issue in all studies and incidents is the importance of early control of external massive haemorrhage with a tourniquet at the scene; this is the first cause of preventable death that bystanders and first responders can – and should – treat.

In USA and Europe, there are several models of deliberate MCI management. The response is usually based within the Tactical Combat Casualty Care (TCCC) and Tactical Emergency Casualty Care (TECC) doctrines that involve several response phases according to the threat level. Even if it seems there is international agreement on these areas, each country and organisation has chosen

The priority is safety	
Personnel without the required Personal Protective Equipment (PPE) must not access the hot zone or epicentre of the incident	
Different dangers need to be minimised or eliminated by different professionals, for example:	Fire: Personnel from the fire and rescue services
	Electrical incident: Personnel from the corresponding power company
	Incident with weapons/explosives: Military and/or police
Assistance in the hot zone must be minimal so as to not expose victims and professionals to unnecessary danger	
A quick extraction of the injured to a safe zone for appropriate assistance and classification will be performed	
Victim classification will be based on:	Severity of injuries
	Survival possibility
Time taken to assess and manage critical victims at the incident scene must be minimised	

Table 1. Similarities between intentional and conventional mass casualty incidents



Phases of care according to the Committee on Tactical Emergency Casualty Care

a different response model to attend to victims, especially in hot zones (under direct threat) or warm zones (under indirect threat).

The TCCC change of assistance paradigm was developed in the 1990s by Frank Butler and John Hagmann. Features that differentiate this approach include: Stratification of care regarding the level of threat; fire superiority as being the best combat medicine; and training all combatants in self care and buddy care.

Training forward combatants can reduce the time from injury to treatment and avoid unnecessary exposure of medical personnel, maximising efficiency and availability when needed. After all members of the 75 Ranger Regiment were trained in TCCC, the rate of preventable deaths was reduced to three per cent and, in some periods, zero per cent.

Further to this introduction analysis of the different procedures and models based on TCCC and TECC, several questions arise:

- Should we allow access of unarmed personnel to an unsafe area when the main priority – fire superiority – cannot be achieved and there is a clear risk of secondary attacks?
- If the victims in the hot zone of a conventional or intentional MCI have received care involving basic airway management and massive bleeding control with tourniquets, therefore allowing rapid extraction to a safe zone, does it make sense to expose medical personnel with advanced skills to perform basic procedures that can be provided by first responders in high risk areas? and
- Most victims die within the first ten minutes of an attack. If this paradigm shift in managing preventable deaths is successful, is right to expose medical personnel to hazardous areas where they themselves can become victims, creating more casualties and reducing the effectiveness of the response?

Depending on the answers to the above questions, we come to

Does it make sense to expose medical personnel with advanced skills to perform basic procedures that can be provided by first responders in high risk areas?

different approaches, such as the Rescue Task Force (RTF), whose main goal is to locate unarmed medical personnel in the warm zone. Alternatively Tactical Rescue Teams (TRT) or Tactical Response and Rescue Teams (TRRT), comprising armed police personnel with first aid training, can be located in the warm zone.

The focus of both models is to reduce the time from injury to medical care. Although the RTF model can be applied in active shooter incidents when the attacker is inside a building, so the linear progression of the team can be protected with ballistic shields on vanguard, this model is less functional in open spaces or where the position and number of aggressors cannot be clearly defined.

To clarify how such situations are managed in Spain, we need to outline standard operational procedures for terrorist attack response. The Guardia Civil, which operates mainly in rural areas, borders, coastlines and roads, uses the immediate neutralisation of sudden attack protocol (NIAS). Meanwhile, the Cuerpo Nacional de Policía – the national police, which is in charge of security in urban areas – utilises other procedures to co-ordinate response. The AMOK procedure prioritises neutralisation of the aggressor/s, as such situations are characterised by the perpetrator attacking, injuring or killing people indiscriminately until they are immobilised. The other protocol that the national police uses is *Order 50*, an action plan to deal with terrorist attempts.

From these different procedures at national and regional levels, we can assume that in the event of an incident with overlapping jurisdictions and responsibilities, divergences in command structures could occur, as previously seen in Europe and the USA, wasting precious time defining who is in overall charge of command and control and of the resources involved in the response. We should meditate on the need to create a unified procedure at national level in order to avoid – from the first moment of the incident – any delays or contradictory orders along the chain of command.

From the medical response point of view, there are two different and recently designed procedures – the *Ibero Protocol* and the *Victoria I Consensus*. Both aim to enable all response echelons, from the bystander and first responder to advanced medical

personnel, to speak a common language based on the C-TECC recommendations and the Hartford Consensus recommendations, while stressing the training of all those potentially involved.

Unfortunately, there is no agreement among the different organisations and stakeholders to adhere to both procedures, so the final aim of achieving optimal co-ordination among all responders to reduce the number

of victims and improve their survival, is seriously damaged.

As a final note, regarding the development of new procedures or updating those that have already been implemented, we should stress that the Oxford Centre for Evidence-Based Medicine (CEBM) and the Scottish Intercollegiate Guidelines Network (SIGN) indicate the ‘experts’ opinion’ is the lowest level of scientific evidence upon which to base any medical decision. Or as we usually say: “The truth is only in *PubMed*,” which is the free full-text archive of biomedical and life sciences journal literature.



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