



## TRAUMA AND CRITICAL CARE UPDATE

# Challenges in care of trauma patient in Spain. The need for implementation of scientific evidence including secondary prevention<sup>☆</sup>



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### KEYWORDS

Trauma patients;  
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**Abstract** The mortality of trauma patients has improved significantly in recent decades due to a combination of factors: medical care, educational campaigns and structural changes. Generalization of both out-of hospital emergence medical services and the hospital care in specific centers for traumatized has undoubtedly contributed to this decline, but other factors such as periodic campaigns to prevent workplace and traffic accidents, as well as improvements in the road network have played a key role.

The challenge now is to contain mortality, for which is essential an analysis of the situation to detect potential areas of improvement.

The application of diagnostic or therapeutic actions with scientific evidence is associated with lower mortality, but as in other areas of medicine, the application of scientific evidence in trauma patients is barely 50%. Moreover, nearly 90% of trauma deaths occur in the crash site or during the first 72 h of hospitalization, the vast majority as a result of injuries incompatible with life. In these circumstances it is clear that prevention is the most cost-effective activity. As medical practitioners, our role in prevention is mainly focused on the secondary prevention to avoid recidivism, for which it is necessary to identify the possible risk factors (frequently alcohol, illegal drugs, psychotropic medication, etc.) and implement a brief motivational intervention. This activity can reduce recidivism by nearly 50%. In Spain, the activity in this field is negligible; therefore, measures should be implemented for dissemination of secondary prevention in trauma.

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**PALABRAS CLAVE**

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**Retos asistenciales en la atención al paciente traumatizado en España. La necesidad de implementación de la evidencia científica incluyendo la prevención secundaria**

**Resumen** La mortalidad de los pacientes traumatizados ha descendido significativamente en las últimas décadas como consecuencia de una combinación de factores tanto asistenciales como estructurales y educacionales. La generalización de los servicios de emergencias extrahospitalarios y la asistencia hospitalaria en centros específicos para traumatizados ha contribuido sin duda a este descenso, pero otros factores como las campañas periódicas de prevención de accidentes de tráfico y laborales, así como las mejoras en la red viaria han jugado un papel fundamental.

El reto actual consiste en seguir disminuyendo la mortalidad, para lo cual es fundamental un análisis de la situación que detecte las potenciales áreas de mejora.

La aplicación de actuaciones diagnósticas o terapéuticas con evidencia científica se asocia con una menor mortalidad pero, como en otras parcelas de la medicina, en los pacientes traumatizados la aplicación de la evidencia científica apenas llega al 50%. Por otra parte, casi el 90% de los pacientes que fallecen por traumatismos lo hacen en el lugar del accidente o en las primeras 72 h de hospitalización, la inmensa mayoría de las veces como consecuencia de lesiones incompatibles con la vida. En estas circunstancias parece evidente que la prevención es la actuación más eficiente. Como médicos asistenciales, nuestro papel en la prevención se centra fundamentalmente en la prevención secundaria para evitar la reincidencia, para lo cual es necesaria la identificación de los factores de riesgo (generalmente alcohol, drogas ilegales, psicofármacos) y realizar una intervención motivacional breve que puede reducir la reincidencia casi un 50%. En España, la actividad en este campo es prácticamente nula, por lo que deben implementarse medidas para su implantación.

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The care of serious trauma patients has clearly improved in Spain over the last few decades. Protocolized intervention by the Emergency Services and hospital care in specific trauma centers are the two main elements contributing to the improvements in patient care. In addition, other measures such as improvements in the road network, and workplace and traffic accident prevention campaigns, have had an important influence in reducing the mortality rate due to trauma in this country. Achieving further significant reductions in such mortality constitutes a difficult challenge and requires a careful analysis, with the directing of efforts toward the areas with the greatest deficiencies.

One-half of all deaths occur at the crash site during the first few minutes, and of the patients that die in hospital, the immense majority (almost 90%) do so within the first 72 h of admission as a result of anatomical or physiological injuries that are incompatible with life.<sup>1</sup> Deaths that occur at a later stage and which in theory are potentially avoidable occur as a result of complications such as multiorgan failure, infections, acute respiratory distress syndrome, etc., and account for about 2–3% of the total fatalities.<sup>2</sup> Considering the above, it is reasonable to assume that improvements in the management of specific injuries (head, thoracic, abdominal-pelvic and limb injuries) will hardly improve the prognosis of these patients.

Although we still seek to reduce the mortality rates among polytraumatized patients, the margin for such improvement may be scarce. Probably the most efficient way to reduce avoidable deaths is to encourage application of the treatment guides based on scientific evidence.

Nevertheless, there are studies that suggest the contrary—reporting a stable mortality rate despite intense efforts to improve the management of trauma patients.<sup>3</sup> This could be because certain centers of excellence may have reached such a low mortality rate that further significant reductions are technically not feasible.

However, patient care is not homogeneous, and there are centers with a greater margin for improvement because of lesser adherence to the scientific advances.<sup>4,5</sup> Shafi et al.,<sup>4</sup> in a multicenter study, found that a 10% increase in compliance with scientific evidence resulted in a 14% decrease in mortality risk among the most serious trauma cases. There are no data in Spain on the degree of compliance with scientific evidence. Nevertheless, on extrapolating data from trauma centers in the United States, it is seen that almost 50% of the recommended diagnostic or therapeutic measures are not adequately applied, and this percentage is even higher among the most serious trauma cases.<sup>6</sup> As in other areas of Medicine,<sup>7–10</sup> it is clear that application of the demonstrated scientific advances is a pending issue with much room for improvement.

Prevention, particularly secondary prevention, is another pending issue. Primary prevention aims to avoid disease (in this case injury) from occurring, and the responsibility of the attending physician is limited in this respect. In contrast, secondary prevention aims to avoid recidivism based on analysis of the risk factors and intervention targeted to them. It is considered that in the ideal event that all management errors and possible complications such as pulmonary embolism, acute respiratory distress, etc., could be

avoided, the mortality rate could be lowered by 13%. In comparison, mortality could be reduced by over 50% with an adequate prevention system, particularly in reference to secondary prevention.<sup>1</sup>

Activity in this field is practically nonexistent in Spain,<sup>11</sup> despite the fact that both the scientific evidence and common sense point to the need to adopt secondary prevention protocols. It is notorious that despite the importance and potential for application of such measures in Spain, little interest has been shown on the part of the public health institutions and scientific societies. To our knowledge, only the Spanish Society of Intensive Care Medicine, together with the Spanish National Plan on Drugs, have drafted a monograph analyzing the different dimensions of the problem and underscoring the need for activity in this field.<sup>12</sup> It is therefore clear that we have important and urgent margin for improvement in this area.

For some time there has been the intention to replace the concept of *traumatic accident* with *traumatic disease*. Such a change is not a minor issue, since it implies a variation in conceptual perception. Traumatic accident is associated with an uncontrollable random or chance factor in which bad luck plays a preponderant role. In contrast, the idea of traumatic disease aims to include all the clinical aspects of the concept of disease, and in this sense randomness or chance is replaced by *associated determinants, with an identifiable causal factor (energy)*. In other words, the new paradigm causes accidents to evolve from something unforeseeable (in which concern only focuses on providing adequate treatment of the injuries) to *traumatic disease*, in which we also must address the underlying etiology and place special emphasis on the risk factors.

It should be remembered that in the year 2004, and for the first time in history, the World Health Organization dedicated the 7th of April to the prevention of traffic accidents and the development of traffic safety as a public health activity. The message chosen could not be more clear: "Traffic safety is no accident".<sup>13</sup>

On examining the risk factors, it is seen that one-half of all injuries are associated to alcohol and drug abuse.<sup>14-17</sup> The data of the European DRUID project show that driving under the effects of alcohol, illegal drugs and certain medications is particularly common in Italy (15%) and Spain (14.8%), while the European average rate is 4.4%.<sup>18</sup> On re-examining the data according to traffic distribution in Spain and including information referred to motorcycles, the percentage of positive cases for such substances was found to be 16.9%.<sup>19</sup>

The aggravating factor of recidivism also must be added to the above considerations. Indeed, in cases of trauma associated to alcohol and drugs, the probability of recidivism doubles in comparison with trauma cases not related to such substances.<sup>20,21</sup>

Reincidence of illegal behavior or involvement in accidents is a problem with enormous sociosanitary and economic implications, and in Spain this issue requires urgent attention. In the hospital setting, secondary prevention measures can reduce recidivism by almost 50%,<sup>22,23</sup> with an excellent cost-effectiveness ratio.<sup>24</sup>

Like all new management activities, the implementation of secondary prevention is not without difficulties. However, if we want to make progress in the field of prevention, the

only option is to control the cause, and in one-half of all cases the cause is alcohol and illegal drugs.

The first step is to identify the association between trauma and substance use based on the determination of toxic agents in blood and urine, or the application of questionnaires such as the AUDIT,<sup>25</sup> followed in positive cases by a structured motivational interview.<sup>26</sup> The aim of this interview is to offer patients information and make them aware of the link between substance use and injury, the risks involved, and the need to change their behavior in this respect. Trauma patients who have consumed alcohol, and particularly those who consume cannabis or cocaine, do not view such habits as implying an increased risk of injuries.<sup>27</sup> The application of such a protocol is associated to significant reductions in the incidence of future injuries.<sup>22</sup>

Any attempt to modify behavior is undoubtedly a complicated task, though convalescence after injury offers an ideal opportunity to try to achieve such changes, since under these circumstances the patients are aware of the risk they have experienced, and are therefore more open and motivated to change their habits.

A number of aspects must be analyzed, such as confidentiality implications<sup>28</sup> and the need for specific training in this field in order to guarantee effectiveness,<sup>29</sup> though the difficulties can be overcome. The situation may be compared with that of a smoker who suffers a heart attack. It is inconceivable for such a patient to leave hospital without receiving express recommendations to stop smoking. In the case of trauma victims, we must identify a possible relation to alcohol and drugs, and if the association is confirmed, we must provide motivational counseling as commented above. The efficacy of such measures has been widely confirmed for alcohol, to the point where in the United States they are now mandatory in all level I trauma centers.<sup>30</sup> Other countries have also identified an urgent need for intervention in this field<sup>31</sup> and, given the magnitude of the problem, are adopting specific prevention plans targeted to concrete populations in which alcohol abuse is a particularly important risk factor.<sup>32</sup>

Focusing our main efforts on prevention does not mean that we should not also advance in diagnostic or therapeutic aspects referred to specific injuries. No matter how small, such advances offer help in the management of our patients, and the fundamental concern of the physician must continue to be the concrete patient dealt with in each moment. Nevertheless, it must be remembered that knowledge in itself is not enough: it must be adequately applied, and we currently have a broad range of resources at our disposal that are often not correctly used. In traumatic disease, as in other fields of Medicine, the implementation of scientific evidence is a priority challenge.<sup>7-10</sup> Evolution from the publication of advances or clinical practice guides to their generalized application is certainly a complex issue that can be influenced by many factors,<sup>33,34</sup> even of a commercial nature,<sup>35</sup> and requires an extensive analysis which falls beyond the scope of this article.

## Conclusion

Our main efforts should focus on two critical situations in trauma patients. On one hand, the implementation of

scientific evidence is low in the most serious trauma patients, despite the fact that it is precisely in these cases where such implementation is particularly useful. Consequently, our main efforts should center on the adoption of protocols warranted by clinical practice guides based on scientific evidence. On the other hand, major deficiencies are seen in the application of secondary prevention protocols in relation to alcohol and drugs. There is scientific evidence that such protocols, targeted to people who drive, afford a decrease in recidivism of almost 50%. Their incorporation to our healthcare system therefore must be a priority concern.

## Conflict of interest

The authors declare that they have no conflict of interest.

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