

# Trauma Care in Oman

## Where do we stand and where should we be heading?

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### العناية بالأصابات في عمان اين نقف الان و أين ينبغي أن نتوجه؟

عمار الكشميري

SINCE THE EARLY 1970S, OMAN HAS WITNESSED a huge leap in development. As part of the modernisation of the country, a wide network of roads was implemented with a significant rise in the use of vehicles at high speeds. This increased motorisation has resulted in an epidemic of traumatic injuries and deaths due to road traffic crashes (RTCs).<sup>1</sup> The burden that these RTCs pose on the health system and the economy is significant; in fact, RTC-associated injuries are the leading cause of disability-adjusted life years and years of life lost in Oman.<sup>2</sup> In particular, the mortality rate is especially high among individuals aged 26–50 years old.<sup>3</sup> In October 2009, His Majesty Sultan Qaboos bin Said urged the people of Oman to identify effective solutions to limit the loss of life on the roads. Since then, there have been many efforts to deal with this issue at different levels.

A strategic road safety research programme has been established under the umbrella of The Research Council (TRC) to promote scientific research and build national research capacity in road safety, including trauma care services.<sup>4</sup> A landmark paper presented in collaboration with the Johns Hopkins Center for Injury Research and Policy in the USA recently provided an overview of the Omani health system with the goal of examining its trauma care capabilities and injury control policies.<sup>5</sup> The efforts exerted to improve trauma care in the Omani health system have been serious and genuine; however, such endeavours have been somewhat fragmented and emergency care services are still lagging behind in their goal of providing timely and effective care to trauma victims.<sup>5</sup> The onus is on the Ministry of Health and other major stakeholders to develop a well-integrated and comprehensive national trauma system. This editorial focuses on the importance of a trauma system and several of its components in the Omani health system, including recommendations for future directions. Some of

the points highlighted in the aforementioned article presented by the Johns Hopkins Center for Injury Research and Policy are reiterated.<sup>5</sup>

Trauma systems are designed to centralise resources and experience and thus assure complete access to definitive trauma care. Such systems are intended to maximise efficiency and ensure the rapid delivery of high-quality care, as the early resuscitation of trauma victims within the 'golden hour' is essential for improved outcomes.<sup>6</sup> Trauma systems have been repeatedly shown to be effective in preventing disability and increasing the chance of survival.<sup>7–9</sup> In addition to health outcomes, investment in reducing RTC-related morbidity and mortality among relatively young individuals provides significant economic benefit as such individuals usually form the most productive section of society.<sup>10</sup> A regional trauma system consists of a public health model designed to reduce morbidity and mortality due to a type of injury within a specified population.<sup>11</sup> This system covers the entire relevant period from the time of the injury when pre-hospital care is initiated, through resuscitation and surgical intervention to subsequent rehabilitation.<sup>12</sup>

Emergency medical services (EMS) constitute the first component of pre-hospital care within a trauma system. These services must be geographically distributed to ensure the comprehensive coverage of all populated regions and to allow prompt response to emergency situations and the timely transport of trauma patients. In addition, EMS personnel provide advanced trauma life support interventions such as airway and haemorrhage control. In Oman, the national EMS system was officially launched in 2004 and consists of advanced emergency care paramedics stationed at 36 centres across the country.<sup>13</sup> Currently, the EMS system focuses on responding to RTC-related traumatic injuries. However, there are several limitations to the present EMS system, including the

absence of a developed medically-oriented dispatch centre and aero-medical ambulances as well as limited coverage of certain areas.<sup>13</sup> A previous publication assessing the effectiveness of the Omani EMS system in reducing RTC-related morbidity and mortality found a non-significant reduction in in-hospital mortality compared with privately transported trauma patients.<sup>14</sup> In addition to addressing highlighted deficiencies, there is a need to expand the scope of the EMS system in Oman to include domestic medical emergencies.

Trauma centres are hospitals designated to receive severely injured patients that are at increased risk of death. Evidence indicates that the outcomes of injured patients admitted to trauma centres are superior to those of patients admitted to other acute care facilities.<sup>15</sup> In the USA, once a hospital meets specific criteria as established by the American College of Surgeons (ACS), it is designated as a trauma centre.<sup>16</sup> These criteria define different levels of trauma centres according to the specific capabilities available in each hospital; a level I centre provides the greatest level of care, with comprehensive 24-hour in-house coverage by trauma surgeons while a level V centre provides the lowest level of care, with limited services. The decision as to which level of facility is appropriate for a specific patient is made at the pre-hospital level on the basis of their injury severity score.<sup>16</sup> In Oman, the highest level trauma hospitals—the Sultan Qaboos University Hospital and Khoula Hospital—are located in Muscat, the capital city. However, according to the ACS criteria, the former would be close to a level II facility and the latter a level III facility.<sup>16</sup> In view of the considerable burden of trauma patients, the country is in need of at least one level I facility to provide total care for every aspect of a patient's injury from prevention to rehabilitation, accompanied by teaching and research resources to help direct new innovations in trauma care.<sup>16,17</sup> In addition, lower level centres distributed in other regions of Oman would significantly contribute to the care of trauma victims.

In order to optimise the outcomes of initial resuscitation efforts among the severely injured, trauma care should be delivered by qualified and trained providers. Developed by the ACS, the approach outlined in the Advanced Trauma Life Support® (ATLS) course is accepted as the standard of care in trauma resuscitation, with trained participants demonstrating significant improvements in knowledge and clinical and management skills.<sup>18,19</sup> The ATLS programme was first established in Oman in 2011, with 24 courses having been delivered and 378 providers trained so far. However, a large number of providers working in acute care settings remain a

target for ATLS training; unfortunately, a major factor limiting enrolment in the programme is the relatively high fees involved. Nevertheless, this course is a necessity, as most providers in acute care settings do not have any structured training in trauma care. There is therefore a dire need to mandate the ATLS course for all doctors involved in the initial resuscitation of trauma victims in Oman.

Furthermore, in order to ensure optimal outcomes, trauma care should be delivered by a multi-disciplinary team.<sup>20,21</sup> A team approach results in more rapid resuscitation and stabilisation of the patient and reduces the time between injury and critical interventions. The leader of the trauma team is often a qualified surgeon or emergency physician who coordinates the resuscitation efforts and ensures adherence to ATLS guidelines.<sup>22</sup> A recent local study compared the resuscitation of multi-trauma patients led by either trauma surgeons or well-trained general surgeons and indicated that there was no difference in outcome; the authors suggested that although the expansion of the available pool of trauma surgeons in Oman may be important, the extent to which this is needed is questionable and that perhaps more attention should be placed on building a cohesive and holistic trauma system.<sup>23</sup> This point should be kept in mind by decision-makers, particularly as trauma surgery training is both lengthy and costly. Therefore, the recommendation at present to improve Oman's trauma capacity is to invest in ATLS training and the establishment of trauma teams.

A trauma registry is another essential component of an effective trauma system and provides a valuable source of information in analysing and improving the existing quality of trauma care at a national level.<sup>24</sup> Registry data also helps in determining policy development and resource allocation as well as in the identification of risk factors for different types of injuries. In addition, the economic and social effects of trauma can be documented and research hypotheses can be developed and tested.<sup>25</sup> Trauma registries are standard in most developed countries and have been successfully implemented in many developing countries as well.<sup>26</sup> As part of a strategic project of the TRC road safety research programme, a recent pilot study at two hospitals in Oman indicated the feasibility of implementing a national, comprehensive and user-friendly electronic trauma registry in Oman, based on the use of mobile health tools.<sup>27</sup>

In conclusion, the health system in Oman is in need of a well-developed and integrated trauma system to effectively deal with the morbidity and mortality associated with RTCs. At present, particular attention should be directed towards the components

highlighted above, including pre-hospital care, trauma centres, capacity development and the development of a national trauma registry.

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