



Management gaps of traumatic spinal cord injuries in war-torn low and middle-income nations: why has this massive problem garnered little attention?

Editorial

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Background

Spinal cord injuries (SCIs) are injuries to the spinal cord that can cause changes in sensation, movement, and other functions below the site of the injury^[1]. Traumatic spinal cord injuries (TSCIs), on the other hand, are injuries to the spinal cord caused by external trauma or force that can range in severity from mild to severe^[2]. Spinal shock, pressure ulcers, bladder and bowel dysfunction, respiratory problems, pain, and psychological issues are all common complications of TSCIs^[2]. The location and extent of the damage, the person's general health, and their age all play a role in determining the specific effects of a TSCI^[2]. TSCIs can have far-reaching consequences for individuals, their families, and society. Physically, TSCIs can cause paralysis, loss of sensation, and difficulty with mobility and daily activities, significantly reducing an individual's independence and quality of life^[1].

The WHO estimates the yearly incidence of TSCIs to be 40–80 cases per million people^[3]. As a result, the precise prevalence of TSCI in low and middle-income countries (LMICs) is poorly understood; however, the estimated incidence of TSCI in LMICs is 25.5 cases per million people per year^[4]. In many nonconflicted LMICs, the leading causes of TSCIs were motor vehicle accidents and fall injuries, but in war-torn areas, the etiologies were different, with more aggressive complications^[3,5].

This article seeks to highlight the management gaps of TSCIs in LMICs, particularly in war zones, and offers suggested recommendations.

The burden of TSCIs in war-inflicted nations and management gaps

Conflict-related TSCIs are typically more dangerous and complex than other TSCIs. Explosions, gunshot wounds, and motor vehicle collisions are the most common causes of these TSCIs. The first large-scale TSCIs occurred during the American Civil War^[5]. These massive traumatic complications spawned and advanced the surgical field in the 20th century. In recent decades, several countries have experienced devastating conflicts, including Iraq, Afghanistan, Syria, Vietnam, Ukraine, and many others, with numerous severe consequences for the human population. The majority of the population is believed to have experienced serious surgical and neurological sequelae, but a rigorous evaluation of these problems has been greatly hampered by underreporting. Most papers on conflict-related TSCIs mainly focus on military personnel and have little or no information on civilian populations in these war zones, which is a major concern.

Depending on the conflict and the type of data evaluated, estimates of the prevalence of TSCI among combatants in war zones can differ significantly. For example, a study discovered that ~11% of soldiers injured in Afghanistan and Iraq sustained TSCIs^[6]. Another study in Iraq found that violence accounted for 64% of TSCIs, more than all other causes combined^[7]. Although underreporting in such regions does not give a complete picture, it is anticipated that the same findings apply to other regions in conflict. In war-torn countries, managing TSCIs can be difficult due to a plethora of factors, including deteriorated healthcare systems due to massive healthcare infrastructural destructions, no or limited access to medical care, an extremely high patient burden, insufficient healthcare providers, particularly surgeons, and poor rehabilitation services. According to the Iraq study, only 69% of the patients were able to complete rehabilitation, with nearly 4% mortality due to poor management^[7]. Another study highlighted those individuals with TSCIs in Afghanistan who received insufficient or no rehabilitation services. Most of these patients were not even offered postrehabilitation services^[8]. These findings are consistent with Ukraine's current plight with massive trauma cases and mortality in an extremely fragile healthcare system^[9]. Regardless of the large number of traumatic and surgical cases such as TSCIs, fractures, and brain injuries in Ukraine, surgical delivery and rehabilitation services are severely lacking. Gosling *et al.*^[9] highlighted in their

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paper that Ukrainians had almost no national strategies for rehabilitation services despite their huge needs. Poor rehabilitation services in war zones can result in a significant burden of disabilities due to the long-term devastating complications that conflict-related traumatic cases can cause.

In addition, military personnel and civilians with TSCI-related disabilities and other devastating complications suffer a serious high toll of mental health problems, particularly PTSD, in these war-torn nations. It also has a significant negative impact on families and communities, as people with TSCI may struggle to maintain relationships and support networks^[8]. According to one study published in the *Community Mental Health Journal*, 54% of US Iraq/Afghanistan war veterans screened for mental health problems had PTSD and depression^[10]. Another study published by the American Psychiatric Association discovered that Vietnam War veterans who received mental health treatment experienced cognitive difficulties such as memory, concentration, and decision-making issues^[11]. Individuals with TSCI in Afghanistan face long-term complications, which are exacerbated by significant social and cultural barriers such as discrimination^[8].

There is poor TSCI research and data in almost all LMICs, causing an information gap and making it difficult to accurately assess the prevalence and impact of SCI in these countries, as well as develop effective prevention and management strategies. TSCIs can also have a significant and multifaceted impact on society, especially on the economy due to the high level of disability concerns. The annual direct and indirect costs of TSCIs in high-income countries such as Canada are estimated to be \$2.67 billion^[12]. Although the direct and indirect costs of TSCIs are not well documented in LMICs, it is worth noting that TSCIs have significant economic and social consequences for individuals and their families, as well as broader societal impacts.

Recommendations

Although TSCIs are extremely life-threatening and have severe complications, they have garnered little attention. Their complexities necessitate advanced management efforts, particularly in LMICs. Much greater investment in healthcare infrastructure, such as new specialized hospitals and rehabilitation centers, can aid in the management of TSCI in LMICs. All of this could be accomplished through increased funding and more equitable resource allocation. A multidisciplinary approach is required for the effective management of TSCI, so more specialists, particularly neurosurgeons, trauma surgeons, and orthopedic surgeons, as well as nonphysician team members, must be trained.

Furthermore, war-torn countries should be given special consideration because they may have the most TSCI cases with significant unmet needs. There are few or no reports from such battle zones, so more study is needed to thoroughly evaluate the issues. Resources should be dispersed fairly, especially in these areas, to fill these research gaps. Civilian cases of TSCIs in these combat zones need to be thoroughly examined to be appropriately treated, as opposed to focusing many studies on military personnel. War-torn areas are in desperate need of healthcare services, particularly surgical services, and their current situation makes providing effective treatment for simple cases, let alone complicated cases such as TSCIs, difficult. Massive international and humanitarian support efforts are needed to supplement the healthcare systems in these conflict zones, which are currently in ruins. There could be more specialists and nonphysician staff,

more funds, more healthcare supplies, low- or no-cost training for their healthcare workers, and a number of other approaches.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, MAH, upon reasonable request. The data are not publicly available since this could compromise the privacy of research participants.

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