Trauma outcome research – More is needed

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Conflicts of interest
None.

doi: 10.1111/aas.12875

Acta Anaesthesiologica Scandinavica has a growing portfolio of trauma-related research. In Scandinavia, the anesthesiologist's practice of actively participation in emergency medicine is considered one of the four pillars of the specialty, not least because the medical specialty emergency medicine has not existed as an independent specialty in Scandinavia.

During the years 2000–2016, the journal published 71 papers with the word 'trauma' in the abstract, and relevant content concerning trauma care. Very few papers were about quality of life after severe injury.[1,2]

In most countries, severe injuries rank as the leading cause of death in the first four decades of life,[3] and are a major cause of potential years of life lost.[4] Severe injuries represent a considerable public health burden, with significant personal and societal costs. Major trauma patients experience a 20% mortality rate overall, and many survivors are left with permanent disability.[5]

One of the challenges in trauma research is defining relevant outcome measures. There are a number of ways that the quality of care provided to injured patients in a trauma system can be assessed. 'Quality indicators' can be conceptualized as descriptions of specific clinical processes or outcomes of care that, when they occur, represent desirable events or unfavorable deviations from an established norm. Quality indicators on outcome can be quality of life, functional outcome, post-traumatic stress, and more. Quality indicators may be perceived as 'sentinel' events in patient care (such as delays in performance of key tests or treatments, or unexpected deaths), which may be associated with poor outcomes and/or sub-optimal care. Many trauma outcome papers report 30-day mortality. Mortality is a robust, dichotomous, and indisputable endpoint, but the continuum between full rehabilitation with recovery to pre-injury state and death is long. Even mortality can be reported in many different ways. Other outcome measures are warranted, as mortality is of limited value to assess outcome for most trauma patients (most that are alive when they reach the hospital, survive). Studies have shown that trauma patients report larger reductions in health-related quality of life compared to other patient categories.[6] This is concerning, as the majority of trauma patients in the ICU are young, and usually have little comorbidity before trauma.[1] The road to functional recovery is complex and requires a more comprehensive application of a bio-psychosocial view of care to understand what the patients consider as a good outcome.[7]

Ulvik et al. used the generic EuroQol-5D (EQ5D) to assess quality of life in trauma patients 2–7 years after major trauma in a Norwegian cohort, including 210 patients median 4 years

Acta Anaesthesiologica Scandinavica
AN INTERNATIONAL JOURNAL OF ANAESTHESIOLOGY AND INTENSIVE CARE, PAIN AND EMERGENCY MEDICINE

post-injury.[1] Eighty percent of the patients experienced problems in one or several of the EQ-5D dimensions compared to pre-injury, especially within the dimension pain/discomfort, and 16% experienced severe reductions in health-related quality of life (HRQOL).[1] Impaired HRQOL was strongly associated with higher early scores on the Simplified Acute Physiology Score and Injury Severity Scale. A prospective study by Tøien et al. reported an improvement in HRQOL from 3 to 12 months post-trauma in 242 trauma patients, using the generic 36-Item Short Form Health Survey (SF-36) measure. The scores were significantly lower compared to the general population. Predictors of a better HRQOL were mainly low score for depression, optimism, and post-traumatic stress (PTS) symptoms at baseline.[8]

Wanner and colleagues recently developed a valid and reliable trauma-specific quality of life measure for future post-traumatic research and clinical care.[7] The Trauma-Specific Quality of Life measurement (TQoL) is a 43-item scale and consists five components: Emotional Well-Being, Functional Engagement, Recovery/Resilience, Peri-Traumatic Experience, and Physical Well-Being. There is an ongoing discussion regarding the use of generic vs. disease-specific HRQOL measurements after trauma. von Steinbuechel compared the use of a generic HRQOL instrument, SF-36, and the disease-specific QOLIBRI in a sample of 795 survivors of traumatic brain injury.[9] The researchers reported that the psychometric performance of both scales was good, although if the focus is on how a certain subscale or sum score differentiates between individuals in one specific dimension or health state, the QOLIBRI was the preferable instrument for discrimination.

In short, a number of instruments exist to assess outcome after severe injury. A comprehensive systematic review from 2014 concluded that there is a lack of inclusive classification systems for measuring disability or health outcome following trauma.[10]

A recent paper in Acta Anaesthesiologica Scandinavica examined quality of life in a group of trauma victims 4.5 years after injury.[2] In this study, the physical component and the mental component of the SF-36 questionnaire was employed. Both physical and mental component results were found to be similar in the two groups compared, before and after implementation of a physician-manned helicopter service. Interestingly, most respondents reported post-injury quality of life at the level of the test's reference population. However, the proportion of severely injured, defined as Injury Severity Score above 15, was low in both groups, 11%. This study was further complicated by a rather low response rate, 402 of 1521 (26%), illustrating a problem with obtaining permission to approach patients when they are not enrolled in parallel to their initial treatment.[11]

Despite recent emphasis on quality of care in medicine, there has been little research to guide trauma clinicians and administrators on how optimally to monitor and improve the quality of care delivered within a trauma system. Large, prospective multicentre studies will help produce more robust estimates of treatment effects.

In conclusion, we need to refine quality indicators and methods for assessment of more than mortality after major injury. The use of advanced methods for observational research, such as propensity scores and instrumental variables, in combination with validated and inclusive outcome measures should be considered the standard for analyzing outcome data from future trauma research.

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