

Trauma Care Before and After Optimization in a Level-I Trauma Center: Life-Saving Changes

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Purpose: The implementation of trauma systems has led to a significant reduction in mortality and length of hospital stay. In our Level-I trauma center, 24/7 in-hospital coverage was implemented, and a renovation of the trauma room took place to improve the trauma care. The aim of the present study was to examine the effect of the optimized in-hospital infrastructure in terms of mortality, processes, and clinical outcomes.

Methods: We performed a retrospective cohort study of prospectively collected data. All adult trauma patients admitted to our trauma center directly during 2 time periods (2010-2012 and 2014-2016) were included. Any patients below the age of 18 years and patients who underwent primary trauma screening in another hospital were excluded. Logistic and linear regression were used and adjusted for demographics and characteristics of trauma. The primary end point was mortality. The secondary end points were subgroups of earlier mortality rates and severely injured patients, processes, and clinical outcomes.

Results: In period I, 1290 patients were included; and in period II, 2424. The adjusted mortality in the trauma room (odds ratio [OR]: 0.35; confidence interval [CI]: 0.12-0.98) and the total in-hospital mortality (OR: 0.65; CI: 0.43-0.98) showed a significant reduction in period II. The emergency room (ER) time decreased by 30 minutes ($P < 0.001$), and the time until CT decreased by 22 minutes ($P < 0.001$). The number of delayed diagnoses and complications were significantly lower in the second period, with an OR of 0.2 (CI: 0.1-0.3) and 0.4 (CI: 0.3-0.5), respectively. The hospital length of stay and ICU length of stay decreased significantly, -0.9 day ($P = 0.032$) and -1.8 days ($P = 0.022$), respectively.

Conclusion: Optimization of the in-hospital infrastructure related to trauma care resulted in improved survival rates in both severely injured patients as well as in the whole trauma population. Moreover, the processes and clinical outcomes improved, showing a shorter hospital length of stay, shorter ER time, fewer complications, and fewer delayed diagnoses.