Ten years of helicopter emergency medical services in Germany: Do we still need the helicopter rescue in multiple traumatised patients?

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ABSTRACT

Background: Helicopter emergency medical service (HEMS) has been established in the preclinical treatment of multiple traumatised patients despite an ongoing controversy towards the potential benefit. Celebrating the 20th anniversary of TraumaRegister DGU® of the German Trauma Society (DGU) the presented study intended to provide an overview of HEMS rescue in Germany over the last 10 years analysing the potential beneficial impact of a nationwide helicopter rescue in multiple traumatised patients.

Patients and methods: We analysed TraumaRegister DGU® including multiple traumatised patients (ISS ≥16) between 2002 and 2012. In-hospital mortality was defined as main outcome. An adjusted, multivariate regression with 13 confounders was performed to evaluate the potential survival benefit.

Results: 42,788 patients were included in the present study. 14,275 (33.4%) patients were rescued by HEMS and 28,513 (66.6%) by GEMS. Overall, 66.8% (n = 28,569) patients were transported to a level I trauma centre and 28.2% (n = 12,052) to a level II trauma centre. Patients rescued by HEMS sustained a higher injury severity compared to GEMS (ISS HEMS: 29.5 ± 12.6 vs. ISS GEMS: 27.5 ± 11.8). Helicopter rescue teams performed more on-scene interventions, and mission times were increased in HEMS rescue (HEMS: 77.2 ± 28.7 min. vs. GEMS: 60.9 ± 26.9 min.). Linear regression analysis revealed that the frequency of HEMS rescue has decreased significantly between 2002 and 2012. In case of transportation to level I trauma centres a decrease of 1.7% per year was noted (p < 0.001) while a decline of 1.6% per year (p < 0.001) was measured for level II trauma centre admissions. According to multivariate logistic regression HEMS was proven a positive independent survival predictor between 2002 and 2012 (OR 0.883; 95%-CI 0.800–0.930; Nagelkerkes-R² 0.539) with only little differences between each year.

Conclusions: This study was able to prove an independent survival benefit of HEMS in multiple traumatised patients during the last 10 years. Despite this fact, a constant decline of HEMS rescue missions was found in multiple trauma patients due to unknown reasons. We concluded that HEMS should be used more often in case of trauma in order to guarantee the proven benefit for multiple traumatised patients.

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Introduction

Helicopter emergency medical service (HEMS) has become a significant component of preclinical treatment of traumatised patients in many countries [1,2]. In Germany for example, HEMS is incorporated in a dense nationwide network of emergency medical services [1–3]. Since its introduction into the civilian rescue system, the effects of HEMS towards time and cost efficiency have been discussed controversially [1,3–5]. In this context, diverse potential disadvantages of HEMS (e.g. high financial burden [6], availability of HEMS due to weather conditions, etc.)