Geriatric emergency general surgery: Survival and outcomes in a low-middle income country

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Background. *Geriatric patients remain largely unstudied in low-middle income health care settings. The purpose of this study was to compare the epidemiology and outcomes of older versus younger adults with emergency general surgical conditions in South Asia.*

Methods. *Discharge data from March 2009 to April 2014 were obtained for all adult patients (≥16 years) with an International Classification of Diseases, 9th revision, Clinical Modification diagnosis codes consistent with an emergency general surgery condition as defined by the American Association for the Surgery of Trauma. Multivariable regression analyses compared patients >65 years of age with patients ≤65 years for differences in all-cause mortality, major complications, and duration of hospital stay. Models were adjusted for potential confounding owing to patient demographic and clinical case-mix data with propensity scores.*

Results. *We included 13,893 patients; patients >65 years constituted 15% (n = 2,123) of the cohort. Relative to younger patients, older adults were more likely to present with a number of emergency general surgery conditions, including gastrointestinal bleeding (odds ratio OR [95% CI], 2.63[1.99–3.46]), resuscitation (2.17 [1.67–2.80]), and peptic ulcer disease (2.09 [1.40–3.10]). They had an 89% greater risk-adjusted odds (1.89 [1.55–2.29]) of complications and a 63% greater odds (1.63 [1.21–2.20]) of mortality. Restricted to patients undergoing operative interventions, older adults had 95% greater odds (1.95 [1.29–2.94]) of complications and 117% greater odds (2.17 [1.62–2.91]) of mortality.*

Conclusion. *Understanding unique needs of geriatric patients is critical to enhancing the management and prioritization of appropriate care in developing settings. (Surgery 2015;158:562-9.)*

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Advances in the quality, delivery, and access to health care have resulted in improved survival and increased life expectancy for people living around the globe.[1] In 2014, average life expectancies ranged from 49.4 to 89.6 years worldwide.[1] Resultant increases in populations as individuals live for progressively greater periods of time have produced a corresponding increase in the number of individuals >65 years old.[2] The global elderly population stands currently at 841 million people.[3] In South Asia, life expectancies have increased by as much as 30 years over the last 50 years.[4] People >65 years of age constitute 9% of the population of Asia and an estimated 6% of the population of Pakistan, a number projected to triple by 2050.[4]

Growing geriatric populations add to the resources and services required to be provided by health systems at an alarming rate.[5-7] To meet these demands and enhance management and prioritization of appropriate geriatric care, the unique needs of geriatric patients need to be understood.

Conflicts of Interest: None to declare.

Presented at the Society of University Surgeons' and Association of Academic Surgeons' 10th Annual Academic Surgical Congress (ASC) in February 2015, Las Vegas, Nevada.

Accepted for publication March 31, 2015.

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0039-6060/$ - see front matter

http://dx.doi.org/10.1016/j.surg.2015.03.045

Previous studies have established the substantial role that surgical conditions play in the utilization of health care resources[8] and the enhanced oversight required to prevent adverse outcomes among older adult surgery patients considered at increased risk for death and complications.[8,9] Hospitalizations for older surgery patients are often complicated by physiologic decompensation, preexisting disorders, polypharmacy, and prolonged hospital stays.[10] The combined effects of these and other considerations mean that aging populations pose new challenges for the dispensation of health care. For many underresourced and resource-constrained settings, knowledge of what services need to be provided and how best to accommodate a poorly appreciated group of patients will be essential as geriatric populations continue to grow.

To date, few studies have examined the needs of geriatric patients in low-middle income health care settings. Recent definition of 621 unique codes using the International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM) for the emerging field of emergency general surgery (EGS), as defined by the American Association for the Surgery of Trauma (AAST),[11] offer a novel means by which to begin to address the dearth of what is known. Studies in the United States have demonstrated that incidence of EGS conditions outstrips the incidence of many major, noncommunicable diseases, including diabetes and ischemic heart disease.[12] In a national assessment of EGS patients, older age (>65 years old) was an independent predictor of mortality for all EGS subdiagnoses.[13] Older patients account for one-half of surgical emergencies and pose the greatest risk for poor surgical outcomes.[8] Thus, in an effort to address the lack of what is known, the purpose of this study was to compare the epidemiology and outcomes of older (>65 years) versus younger (≤65 years) adult patients presenting with a condition requiring EGS. The study describes the burden, spectrum, and outcomes of EGS conditions among geriatric patients managed at a tertiary care facility in South Asia.

METHODS

Study setting and inclusion criteria. The study was performed at the Aga Khan University Hospital in Pakistan, which is a tertiary care teaching hospital in the metropolitan city of Karachi. This hospital, which serves a citywide population of 15.5 million people in addition to patients in need of advanced care nationwide, is equipped with 577 inpatient beds, including 55 critical care beds, and is able to deliver specialized surgical care provided by surgeons trained in the subspecialty areas of cardiothoracic surgery, vascular surgery, otolaryngology, and urology. We included all adult patients (≥16 years of age, consistent with institutional policies and the World Health Organization definition of an adult[14-16]) treated between March 2009 and April 2014 for an AAST defined EGS condition as defined by the AAST.[11]

Data acquisition. Patient records from the Aga Khan University Hospital were for queried for specific ICD-9-CM diagnosis codes consistent with an EGS condition (Supplementary Table I).[10] Records were also queried for common procedures performed for EGS patients using ICD-9-CM procedure codes, as defined previously by Shah et al[13] (Supplementary Table II). Common procedures included the 10 most frequently performed procedures for a diagnostic category.

We abstracted information about patient demographics and clinical case-mix characteristics, including age in years, sex, type of admission (emergency department ["emergent"] vs elective), managing specialty (general surgery admission vs specialty care), Charlson Comorbidity Index,[17,18] receipt of operative intervention, year of admission, and diagnostic category (as defined in Supplementary Table I). Primary outcome measures included assessment of all-cause mortality, occurrence of ≥1 complication, and duration of inpatient hospital stay. Complications included pneumonia, pulmonary emboli, urinary tract infection, myocardial infarction, cardiac arrest, renal failure, cerebrovascular accident, sepsis, or septic shock during the initial hospital stay. Duration of stay was obtained from dates of hospital admission and discharge records. Selection of complications was made based on prior work by Ingraham et al,[19] which defined complications with known, high attributable mortality among trauma/EGS patients.

Statistical analysis. Patients categorized as older (>65 years) versus younger (≤65 years) adults were compared for differences in demographic/clinical characteristics and outcome measures using descriptive statistics. Pearson Chi-square tests were used to assess differences in categorical variables; 1-way analysis of variance and Mann–Whitney *U* tests were used to compare distributions of normal and non-normally distributed continuous age and durations of stay, respectively. Baseline differences in sex and the Charlson Comorbidity Index were accounted for in subsequent models using propensity scores. Multivariable logistic regression was used to calculate risk-adjusted differences in odds ratios