INTRODUCTION:

The degradation in quality of life following the onset of a vertebral compression fracture (VCF) has been reported in a number of studies [1]. However, the association between VCF and patient longevity is less well studied. Mortality risk has been shown to increase by 23% following the onset of VCFs [2]. However, the study population from the existing mortality studies has been relatively small and limited to white elderly women from urban areas [3]. A recent survival analysis reported an 83% increase in mortality risk for U.S. Medicare patients with VCF compared to a control population [4]. However, the difference in survival for VCF patients following non-operative and operative (kyphoplasty or vertebroplasty) treatments has not been examined. The goal of this study was to evaluate the mortality risk for patients with VCF undergoing different treatment modalities and to compare the mortality risk for VCF patients at two different time periods.

METHODS:

Patients with a newly diagnosed VCF were identified from Medicare claims submitted by physicians, hospitals, and outpatient clinics between January 1, 2006 and December 31, 2006. These patients were identified from the 100% Medicare national sample using International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnosis codes of 733.13 (pathologic fracture of vertebrae) or 805.0, 805.2, 805.4, 805.6, or 805.8 (cervical, thoracic, lumbar, sacrum/coccyx, and other unspecified vertebral fractures). To ensure that the diagnoses represented new fractures, only patients who were Medicare beneficiaries in the prior year, with no previously diagnosed VCFs during that period were included. Patients younger than 65, those enrolled in health maintenance organizations, those not enrolled in both Part A (hospital insurance) and Part B (medical insurance) of the Medicare, and those residing outside of the U.S. were excluded from the analysis.

The mortality rate associated with VCF was evaluated by determining the date of death from the annual Medicare “denominator” file. Survival of a VCF patient was calculated from the index diagnosis date until death or end of follow-up on December 31, 2006. Overall survival was estimated by the Kaplan-Meier method and the differences in mortality rates were assessed by Cox regression (adjusted for comorbidities) for: 1) non-operated VCF patients compared to operated VCF patients, and 2) VCF patients who underwent kyphoplasty compared to those who underwent vertebroplasty.

RESULTS:

213,544 VCF patients in 2006 were included in the study, of which 25,808 patients underwent kyphoplasty (12.1%) and 14,546 patients underwent vertebroplasty (6.8%). The remaining 173,200 patients were categorized into the non-operated group. The survival rates for non-operated VCF patients was 77.7% at 12 months (Figure 1) Patient age, gender, and race significantly affected survivorship following VCF diagnosis (p<0.0001). Specifically, men had a higher risk of mortality compared to women (adjusted OR=1.70, p<0.0001), while patients aged 70 years and over experienced at least 11% higher mortality rates than those aged 65-69 years (p<0.0003). Compared to white patients, patients who were not white or black (adjusted OR=0.76, p<0.0001) had significantly lower risk of mortality.

At 12 months follow-up, the 40,354 patients that underwent vertebroplasty or kyphoplasty had a higher survival rate than non-operated VCF patients (adjusted OR=0.57; p<0.0001). The survival rates for VCF patients following vertebroplasty or kyphoplasty were 83.0% and 86.0% at 12 months, respectively (Figure 2). The risk of mortality for kyphoplasty patients was 13% lower than that for vertebroplasty patients (adjusted OR=0.87; p<0.0001).

DISCUSSION:

This study establishes the mortality risk associated with vertebral fractures for elderly patients of all ages, ethnicities, and gender in the Medicare population. Our study shows that the risk of mortality at short-term follow-up is significantly higher for patients that do not undergo operative treatment following VCF diagnosis. The risk of mortality for kyphoplasty patients was also significantly lower than that for vertebroplasty patients. It is unclear if these trends would persist with longer follow-up. Although non-operated VCF patients were found to have greater mortality rates, we did not include an investigation of the cascade of events leading to their premature deaths. Further investigation is needed to clarify the sequence of health events that results in these deaths. In terms of mortality, VCF represents a significant health burden to elderly patients.

REFERENCES: