

Are BNP Levels at Time of Injury Predictive of Short and/or Long-Term Morbidity and Mortality After Surgically Treated Hip Fractures?

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Purpose: The purpose of this study is to determine if elevated initial B-type natriuretic peptide (BNP) (BNPi) levels or a percent change from baseline BNP (BNPB) at time of injury predicts short-term and/or long-term morbidity and mortality after geriatric hip fracture surgery, which may subsequently be used as a surrogate marker to predict prognosis. A secondary aim of this study was to analyze the effect of postoperative complications on mortality risk.

Methods: This was a retrospective chart review of all operatively treated hip fractures (femoral neck, intertrochanteric femur fracture, and subtrochanteric femur fractures) in patients ≥ 60 years old between February 2014 and July 2018. Patients were included if they had a BNP level drawn within 48 hours of injury (BNPi) within a single institution's electronic medical records. Perioperative, 30-day, 1-year, and 2-year postoperative complications were recorded. BNPi was analyzed against specific complications to determine if higher BNPi values were associated with greater morbidity and/or mortality. Complications were also analyzed to determine their effect on mortality.

Results: Elevated BNPi values were statistically associated with an increase in morbidity in the perioperative, 30-day, and 1-year postoperative groups. The 1-year postoperative group was found to have an association with increased mortality with increasing BNPi. There were no associations in morbidity or mortality in the 2-year postoperative groups. There were no significant findings in the percent change from baseline BNP value analysis. Univariate analysis further associated death with several complications. Notably, cardiac failure/exacerbation and altered mental status were associated with an increased mortality in all groups and respiratory failure was associated with death in all groups except the 2-year postoperative group.

Conclusion: Patient with lower BNPi levels who sustain hip fractures are possibly less likely to develop complications up to 1 year postoperatively and several complications are associated with increased mortality. Potential inpatient treatment approaches to lower BNP levels following a hip fracture may mitigate certain perioperative and postoperative complications, including mortality. However, the threshold BNP level in which morbidity and mortality increases is unknown and warrants further study. Considering the information ascertained from this study the authors suggest obtaining a BNP level in all hip fracture patients at time of injury. The data obtained can be used for providers in conjunction with the internal medicine physicians to decide which patients could benefit from further medical optimization. Future studies may better define a threshold BNP level.