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"REBOA Use and Complications in Geriatric Trauma Patients: Insights from a Multi-Center Database"

Introduction: Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) is an adjunct treatment for trauma patients with noncompressible torso hemorrhage. Complications seen with REBOA utilization include ischemia caused by occlusion, limb amputations, post-operative thrombosis, rhabdomyolysis, and access site complications. The use of REBOA in the geriatric population has not been well-studied. This study aimed to define REBOA use and complications in the geriatric population. It was hypothesized that patients 65 or older may have greater rates of complications, compared to those under 65, due to geriatric patients having a greater likelihood of pre-existing co-morbidities.

Methods: Utilizing the AORTA database, which contains data from over 50 ACS Level 1 centers in the United States where REBOA is being used, we analyzed adult trauma patients stratified by age (18-64 versus ≥ 65). Collected data included vitals upon arrival to ED, GCS, mechanism of injury, placement, length of occlusion, development of acute kidney injury (AKI), and access site complications. Data were analyzed using Fisher's exact test and Student's t-test with p value <0.05 considered to be significant.

Results: A total of 3,384 patients were analyzed and 311 patients or 9.2% were geriatric. There was no significant difference in injury severity score (33.1± 2.3 for geriatric patients and 33.8 ± 0.8 for non-geriatric, $p = 0.56$). The distribution of REBOA zone placement was similar for geriatric and non-geriatric patients. The length of REBOA occlusion for geriatric (32.3 ± 10.8 minutes) and non-geriatric patients (47.5 ± 7.4 minutes) was not significantly different ($p= 0.13$). There was no significant difference in the development of AKI (11.0% for geriatric patients and 10.8% for non-geriatric, $p = 0.92$). Of the access site complications analyzed, there was a significant increase in access site pseudoaneurysms in geriatric patients (1.6%) compared to non-geriatric patients (0.4%) ($p = 0.019$). Interestingly, there was a decrease in the development of extremity ischemia in geriatric patients compared to non-geriatric patients (0 vs 1.3%, $p = 0.045$). There was not a significant difference between geriatric and non-geriatric patients in development of hematoma, arteriovenous fistula, stenosis, or distal embolism.

Conclusions: REBOA use was similar among geriatric and non-geriatric patients. Age greater than or equal to 65 was significantly associated with greater incidence of pseudoaneurysm and decreased incidence of extremity limb ischemia. This difference could be due to pre-existing peripheral vascular disease or anatomic differences in this patient population. Future directions include studies to understand the association of specific co-morbidities with REBOA complications among geriatric trauma patients.