



Heart Failure Outcomes with Volume-Guided Management in an Over-65 Population

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ABSTRACT

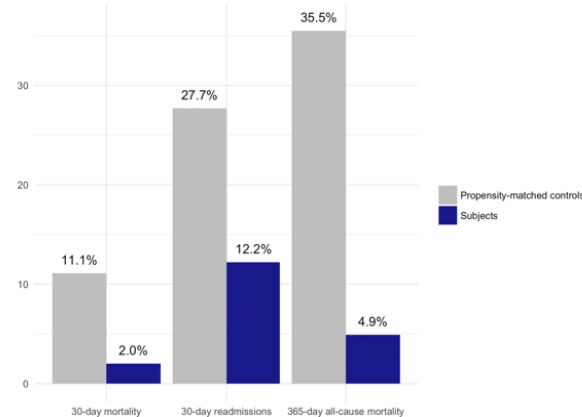
Background: Heart failure (HF) is the leading cause of death among the population covered by Medicare. Understanding the impact of treatment decisions on outcomes for this specific group is of particular relevance to US Healthcare, as decisions made by the Centers for Medicare & Medicaid Services (CMS) regarding reimbursement, outcome-based incentives and penalties applied to health providers, and indication guidelines have enormous impact on how healthcare is provided. A recently published propensity-matched control study¹ examining the effect of volume-guided management of HF reported significantly better outcomes for patients receiving volume-guided treatment. A secondary analysis was performed on the data from this study to quantify the effects of this treatment on an over-65 population.

Methods: Propensity-score control matching analysis was performed for 216 consecutive age over-65 HF admissions to a community hospital (2007–2014, age 80.7 ± 7.5 yrs, HFref 47%). Total blood volume (TBV), red blood cell volume (RBCV) and Plasma Volume (PV) were measured at admission by a computer-based I-131 labeled albumin indicator-dilution technique [Daxor BVA-100].

Results: While 64% of subjects had PV expansion, only 36% were hypervolemic (TBV >10% excess). True anemia (RBCV ≥10% deficit) was present in 62% of subjects. Treatment of true anemia without hypervolemia resulted in a rise in peripheral hematocrit (pHct) of 2.6% ± 2.9, P<0.001, and diuretic treatment of hypervolemia without anemia caused a 4.5% ± 3.9, P<0.001 increase in pHct at 11.0 ± 6.7 days after admission. Subjects had lower 30-day readmission (12.0% vs 27.0%, P<.001), 30-day mortality (2.3% vs 11.8%, P<.001), and 365-day mortality (5.6% vs 36.8%, P<.001) rates but longer length of stay (LOS) (7.2 vs 5.5 days, P<.001) than controls. Analyzing 30-day readmissions by diagnosis, subjects had fewer HF readmissions (6.5% vs 19.9%, P<.001), fewer cardiac non-HF readmissions (0.9% vs. 3.9%, P=.06) and comparable non-cardiac readmissions (3.7% vs 3.2%, P=.34).

METHODS

Subjects were consecutive admissions of over-65 patients to a community hospital HF service. Controls were selected from a CMS dataset. Subjects and controls were included only if they were at least 65 years old on the date of admission. This resulted in a filtered "over-65" database containing 216 subjects and 2191 controls (as opposed to the original study's 245 subjects and 2450 controls). Intravascular volume was measured shortly after admission using BVA, an I¹³¹-labeled human serum albumin indicator-dilution technique (Daxor Corporation, New York, NY), and the results utilized to guide treatment. Decongestion strategy targeted TBV to 6%-8% above patient-specific norm. Anemia was corrected with iron, epoetin, and/or packed red blood cells. Hct measurements were monitored as treatment progressed to assess effectiveness of interventions. Controls derived from CMS data were matched 10:1 for demographics, comorbidity, and year of treatment.



RESULTS

The over-65 subset of the dataset produced an excellent match between subjects and propensity-matched controls - mean values were well matched for all characteristics and no statistically significant differences emerged. Subjects were age 80.7 ± 7.5, 57% male, with a Charlson comorbidity score of 2.75 ± 1.47; controls were age 80.6 ± 7.5, 55% male, with a Charlson comorbidity score of 2.72 ± 1.6.

Study cohort patients experienced markedly better outcomes vs controls for 30-day readmissions (12.0% vs 27.0%, P<.001), 30-day mortality (2.3% vs 11.8%, P<.001), and 365-day mortality (5.6% vs 36.8%, P<.001) rates (Figure 1) and an increase in LOS vs controls (7.2 vs 5.5 days, P<.001).

CONCLUSIONS

Retrospective outcomes using volume-guided HF therapy vs propensity-matched controls support the benefit of BVA in guiding volume management and reducing re-hospitalization and mortality due to HF in the over-65 population.

REFERENCES

1. J. E. Strobeck, J. Feldschuh, and W. L. Miller, "Heart Failure Outcomes With Volume-Guided Management," *J Am Coll Cardiol HF*, vol. 6, no. 11, pp. 940–948, 2018, doi: 10.1016/j.jchf.2018.06.017