

Should Acute Subdural Hematoma of the Elderly be Aggressively Treated?

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Introduction

Acute Subdural Hematoma of the Elderly (ASDHE) patient is a common neurosurgical emergency, but there is limited data about long-term survival of these patients. Comorbidities previously associated with worse outcomes, especially anticoagulation, are prevalent in the elderly. There is a lack of data regarding how specific comorbidities and surgical interventions correlate with long-term survival, which complicates medical decision making.

Methods

Retrospective review of our Level 1 trauma center database identified 96 ASDHE patients between 2001-2012 with sufficient data to meet inclusion criteria. Social security death index data was used to calculate length of survival post-discharge. Chi-square tests and two sample nonparametric tests were used to assess the association of in-hospital mortality with demographic, past medical history and admission information. Logistic regression used to assess more than one variable with in-hospital mortality. Similar tests used to compare surgical treatment groups. Logrank tests and Kaplan-Meier methods were used to assess the post hospitalization survival.

Results

34/54(63%) of those treated non-surgically (NS) and 18/30(60%) treated with craniotomy (CR) survived their hospital stay (p=0.79). Average length of survival following discharge was 38.6 months (NS) versus 37.0 months (CR; p=0.88). Hematoma thickness averaged 8mm (NS survivors), 12mm (NS non-survivors), 12mm (CR survivors), 19.5mm (CR non-survivors). Length of stay for surviving patients was 5 days (NS) vs. 16 days (CR; p=0.006). Average presenting GCS of surviving patients was 13.8, vs. 7.8 for non-surviving patients, irrespective of intervention (p <0.001). All seven patients treated with burr holes survived hospitalization, after an average of 5.8 day hospitalization and average survival of 24.1 months post-discharge.

Conclusions

Surgically treated ASDHE patients are equally likely to survive hospitalization and survive for a comparable duration compared to patients treated non-surgically. The average thickness of SDH which was lethal in the nonsurgical group was identical to the average thickness of SDH in surviving craniotomy patients (12mm), though length of stay is significantly longer in survivors who underwent craniotomy. This data supports the potential for good surgical outcomes in appropriately selected ASDHE patients.

Table 1: Demographic and past medical history information with in-hospital mortality

| Variable | Response | All Patients N (%) ¹ | In-hospital mortality N (%) ² | p-value ³ |
|-----------------------|----------|---------------------------------|--|----------------------|
| Sex | Male | 34 (37%) | 12 (35%) | 0.273 |
| | Female | 57 (63%) | 14 (25%) | |
| Anti-coagulation used | Yes | 47 (57%) | 11 (23%) | 0.866 |
| | No | 36 (43%) | 9 (25%) | |
| HTN | Yes | 67 (81%) | 18 (27%) | 0.227 |
| | No | 16 (19%) | 2 (13%) | |
| CAD | Yes | 44 (54%) | 11 (25%) | 0.721 |
| | No | 37 (46%) | 8 (22%) | |
| Afib | Yes | 23 (28%) | 8 (35%) | 0.080 |
| | No | 59 (72%) | 10 (17%) | |
| Diabetes | Yes | 19 (24%) | 2 (11%) | 0.191 |
| | No | 61 (76%) | 15 (25%) | |
| Alcoholism | Yes | 1 (1%) | 0 (0%) | N/A |
| | No | 82 (99%) | 20 (24%) | |
| Cancer | Yes | 19 (23%) | 7 (37%) | 0.116 |
| | No | 62 (77%) | 12 (19%) | |
| Parkinson's disease | Yes | 3 (4%) | 1 (33%) | N/A |
| | No | 78 (96%) | 19 (24%) | |
| Previous stroke | Yes | 20 (25%) | 2 (10%) | 0.147 |
| | No | 59 (75%) | 15 (25%) | |

¹Percent of all patient without missing information (row percentage).

²Percent of in-hospital deaths by each variable (column percentage).

³P-value from chi-square test.

Table 2: Admission and surgical treatment information with in-hospital mortality

| Variable | Response | All Patients N (%) ¹ | In-hospital mortality N (%) ² | p-value ³ |
|------------------------------|------------------|---------------------------------|--|----------------------|
| GCS<8 | Yes | 18 (22%) | 15 (83%) | <.001 |
| | No | 63 (78%) | 9 (14%) | |
| SDH size > 1cm | Yes | 42 (54%) | 18 (43%) | 0.002 |
| | No | 36 (46%) | 4 (11%) | |
| Midline shift | Yes | 44 (56%) | 16 (36%) | 0.011 |
| | No | 35 (44%) | 4 (11%) | |
| Trauma | Fall sit/stand | 65 (78%) | 13 (20%) | 0.061 |
| | Fall from height | 6 (7%) | 4 (67%) | |
| | MVS | 10 (12%) | 2 (20%) | |
| | Other | 2 (2%) | 1 (50%) | |
| Concurrent broken bones | Yes | 20 (27%) | 5 (25%) | 0.771 |
| | No | 55 (73%) | 12 (22%) | |
| Pupil reactivity (worse eye) | Yes | 59 (74%) | 7 (12%) | <.001 |
| | Sluggish | 8 (10%) | 1 (13%) | |
| | No | 13 (16%) | 12 (92%) | |
| Surgical treatment | None | 54 (59%) | 16 (30%) | 0.206 |
| | Craniotomy | 30 (33%) | 10 (33%) | |
| | Burr holes | 7 (8%) | 0 (0%) | |

¹Percent of all patient without missing information (row percentage).

²Percent of in-hospital deaths by each variable (column percentage).

³P-value from chi-square test.

Learning Objectives

1) Describe the factors which correlate to survival in ASDHE patients; 2) Discuss how and to whom these data should be applied to; 3) Identify an effective treatment plan for patients using outcome data gathered in this study.

Table 3: In-hospital mortality for GCS and SDH Size Combinations (n=69)

| GCS status | SDH Size | N | In-hospital mortality N (%) |
|------------|----------|----|-----------------------------|
| ≥8 | < 1cm | 31 | 1 (3%) |
| ≥8 | ≥ 1cm | 22 | 7 (33%) |
| <8 | < 1cm | 2 | 2 (100%) |
| <8 | ≥ 1cm | 14 | 11 (79%) |

References - On request