

Introduction

Delayed cerebral ischemia (DCI) is a serious complication of aneurysmal subarachnoid hemorrhage (aSAH), and a major predictor of poor functional outcomes in patients surviving the initial insult. Several theories have postulated that platelet activation, microthrombi formation and subsequent vasospasm are mechanisms that originate this complication. We therefore assessed the effect of premonitory antiplatelet medications (APMs) use on discharge functional outcomes and cerebral infarction due to DCI in patients presenting with aSAH.

Methods

A retrospective analysis of patients admitted to a single US center with aSAH from 2007-2016, according to their admission APM status was performed. Patients who were receiving APM prior to admission were then matched to those who did not receive them by using nearest-neighbor propensity score-matching (PSM) controlling for the following variables: age, hypertension, smoking status, Hunt-&-Hess classification and management type.

Table 1

| Variables | No 20 (50.0%) | Yes 20 (50.0%) | p-Value |
|--|------------------|-------------------|---------|
| Age | 62.1 (±13.8) | 62.7 (±12.0) | 0.87 |
| Gender | | | |
| Female | 15 (75.0%) | 13 (65.0%) | 0.49 |
| Male | 5 (25.0%) | 7 (35.0%) | |
| Smoking | 8 (40.0%) | 6 (30.0%) | 0.51 |
| HTN | 14 (70.0%) | 13 (65.0%) | 0.74 |
| Anticoagulation on presentation | 0 (0.0%) | 1 (5.0%) | 0.31 |
| Aneurysm morphology | | | |
| Saccular | 17 (85.0%) | 18 (90.0%) | 0.63 |
| Fusiform | 3 (15.0%) | 2 (10.0%) | |
| Circulation location | | | |
| Anterior | 15 (75.0%) | 15 (75.0%) | >0.99 |
| Posterior | 5 (25.0%) | 5 (25.0%) | |
| Aneurysm Max. Size (mm) | 5 (IQR 3.4 - 7) | 5 (IQR 4 - 7.2) | 0.87 |
| Multiple aneurysm | 2 (10.0%) | 0 (0%) | 0.15 |
| SBP on admission | 136.2 (±28.3) | 137.7 (±19.7) | 0.84 |
| SBP on admission ≥140 | 10 (55.6%) | 10 (50.0%) | 0.73 |
| WFNS | | | |
| 1 | 11 (55.0%) | 8 (40.0%) | 0.38 |
| 2 | 2 (10.0%) | 1 (5.0%) | |
| 3 | 0 (0%) | 2 (10.0%) | |
| 4 | 2 (10.0%) | 5 (25.0%) | |
| 5 | 5 (25.0%) | 4 (20.0%) | |

Comparative analysis according to antiplatelet medication on admission after PSM adjusted for age, hypertension, smoking status, Hunt & Hess classification and management type.

Results

Out of the 267 patients identified, 38 (14.2%) were on APMs when admitted. On univariate analysis, patients on APM were older ($p < 0.001$), and more likely to be hypertensive ($p = 0.005$). Modified Rankin Scale (mRS) at discharge was significantly worse for patients on APMs compared to those who were not (mRS 3-6 in 55.3% vs 32.7%; $p = 0.007$). No significant difference in cerebral infarction due to DCI was found ($p = 0.82$). PSM resulted in 20 patients in the APMs group and 20 patients in the comparison group. After matching, no significant difference was found in discharge mRS ($p = 0.56$) and cerebral infarction due to DCI ($p = 0.7$).

Conclusions

This study did not identify any significant effect of admission APMs on discharge functional outcomes and cerebral infarction due to DCI in aSAH patients after matching.

Table 1

| Hunt & Hess | | | |
|--|----------------------|-----------------------|-------|
| 1 | 1 (5.0%) | 5 (25.0%) | 0.31 |
| 2 | 8 (40.0%) | 4 (20.0%) | |
| 3 | 5 (25.0%) | 3 (15.0%) | |
| 4 | 4 (20.0%) | 5 (25.0%) | |
| 5 | 2 (10.0%) | 3 (15.0%) | |
| Hunt & Hess (4-5) | 6 (30.0%) | 8 (40.0%) | 0.51 |
| Modified Fisher | | | |
| 1 | 0 (0.0%) | 1 (5.0%) | 0.57 |
| 2 | 1 (5.0%) | 0 (0%) | |
| 3 | 4 (20.0%) | 4 (20.0%) | |
| 4 | 15 (75.0%) | 15 (75.0%) | |
| GCS | 15 (IQR 6.5 - 15) | 14 (IQR 7 - 15) | 0.62 |
| Severe | 7 (35.0%) | 9 (45.0%) | 0.52 |
| Moderate | 0 (0.0%) | 0 (0.0%) | |
| Mild | 13 (65.0%) | 11 (55.0%) | |
| SAH thickness (mm) | 6.6 (IQR 4.8 - 8.9) | 7.5 (IQR 4.9 - 9.1) | 0.57 |
| Cerebral edema | 2 (10.0%) | 4 (20.0%) | 0.38 |
| IPH presence | 5 (25.0%) | 6 (30.0%) | 0.72 |
| Volume IPH (mL3) | 4.9 (IQR 2.2 - 12.1) | 18.6 (IQR 8.6 - 51.8) | 0.2 |
| Seizure during hospitalization | 2 (11.1%) | 2 (10.5%) | 0.95 |
| Cardiac abnormality in first 24 hours | 1 (5.0%) | 1 (5.0%) | >0.99 |
| Hydrocephalus on admission | 9 (45.0%) | 8 (40.0%) | 0.75 |
| EVD in first 24 hours | 9 (45.0%) | 12 (60.0%) | 0.34 |
| VP shunt placement | 2 (10.0%) | 2 (10.0%) | >0.99 |
| Aneurysm management | | | |
| Medical | 2 (10.0%) | 2 (10.0%) | 0.16 |
| Microsurgical clipping | 1 (5.0%) | 6 (30.0%) | |
| Endovascular | 16 (80.0%) | 12 (60.0%) | |
| Clipping+Endovascular | 1 (5.0%) | 0 (0.0%) | |
| Cerebral infarction due to DCI | 5 (25.0%) | 4 (20.0%) | 0.7 |
| mRS at discharge | | | |
| 0 to 2 | 14 (70.0%) | 12 (60.0%) | 0.51 |
| 3 to 6 | 6 (30.0%) | 8 (40.0%) | |