SAFETY AND CLINICAL OUTCOME OF
GOOD-GRADE ANEURYSMAL SUBARACHNOID HEMORRHAGE IN NON-INTENSIVE CARE UNITS

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BACKGROUND

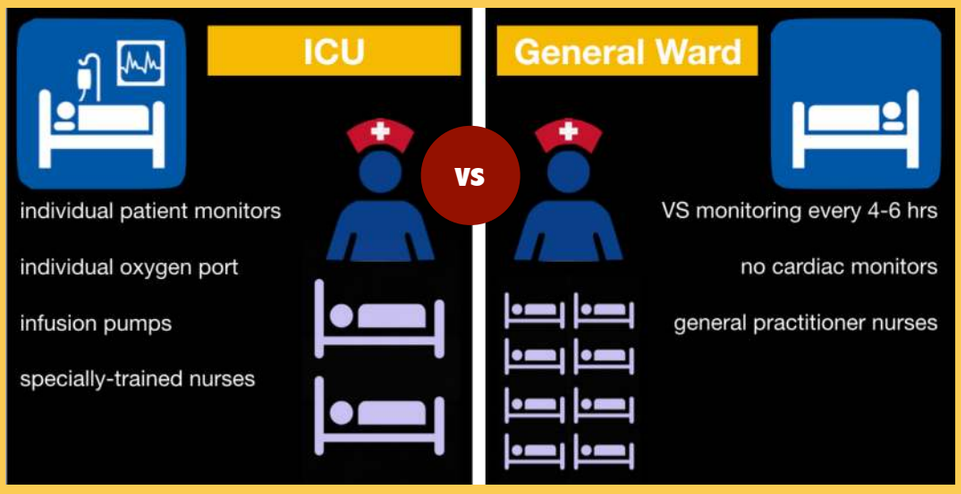
- **Subarachnoid hemorrhage (SAH)** accounts for 10 percent of all strokes, mostly caused by ruptured saccular aneurysms.
- HH Grades 1 and 2 are considered good-grade aneurysmal subarachnoid hemorrhage (aSAH). Upon obliteration of aneurysm, **patients with good-grade aSAH achieve a promising outcome.**
- Blood from a ruptured aneurysm spreads into the cerebrospinal fluid (CSF) leading to a myriad of complications. Neurologic complications include rebleeding, hydrocephalus, delayed cerebral ischemia (DCI), seizures
- **Early recognition and rapid intervention for these complications justify the recommendation for admission of aSAH patients into a multi-disciplinary ICU.**
- In general, patients with SAH demand a high level of care during admission. In a cost analysis study by Roos et al in 2002, aSAH patients were requiring high or intensive care in 73% of total admission time. ICU admission accounted for 45% of total costs of hospital admission.
- **Fewer complications and more favorable discharge Modified Rankin Scale (MRS) were seen in patients admitted in the general ward** compared to those admitted in the ICU.
- Cost analysis revealed that the average **total room cost for a patient admitted in the ICU is five times more** than for a similar patient admitted in the general ward.
- There is a paucity of data comparing the outcomes of ICU and non-ICU admission on patients with good-grade aSAH. This study describes the management and outcomes of good-grade aSAH patients in the ICU and non-ICU. With the increasing demand and limited resources for ICU admissions, the results may change the patterns for ICU utilization in patients with good-grade aSAH.

METHODS

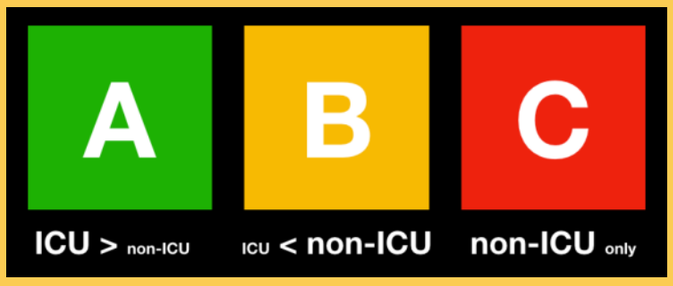
This is a **five-year retrospective cohort study** from January 2013-December 2017.

Setting

Our hospital is the largest training hospital in the country with a 1,000 bed capacity for indigent patients and 500 beds for paying patients. Of these beds, only a few are designed to provide specialized care for acutely ill stroke patients.



Data Classification



Is it safe to admit good-grade aneurysmal SAH in a non-ICU environment?

RESULTS

- Out of the 269 charts reviewed, **242** (89.9%) patients fulfilled the inclusion criteria.
- All three groups shared similar baseline characteristics.
  - The mean age upon admission is **51 years old**.
  - Most patients were **female (64%)** and **hypertensive (71%)**
  - The mean day of ictus upon admission is **10.79**.
  - Most patients came in with **HH grade of 1**
  - The most common location of ruptured aneurysm in the **anterior cerebral artery/anterior communicating artery (40%)**
- Only **two mortalities** were reported.
  - One patient died of **brain herniation from malignant infarction**
  - The other patient died of **septic shock from nosocomial pneumonia**
- Overall, there was **no significant difference in mortality rate between the three groups**.
- **Favorable outcome a**t discharge was seen in **93.8%** of patients.
- The **development of complications** was identified as a predictor of **mortality** (OR 23.35, p=0.01) and **unfavorable outcome** (OR 91.93, p<0.001).
- The most common complications seen in all patients were **DCI**, **nosocomial infections** and **rebleeding**.
  - **DCI** was diagnosed in the **ICU in 22 out of 24 patients** (91.67%, p<0.001).
  - **Nosocomial infection** developed in the **ICU in 13 out of 17 patients** (76.5%, p<0.001).
  - **Rebleeding** occurred in 4 patients, significantly **greater while in the non-ICU** (75%, p=0.02).
- The **longest total hospital stay** was seen in **Group A with a mean of 14.26 days** (p=0.02). This was likely **associated with the significantly higher rate of complications** in this group (p=0.04).
  - The total hospital stay was similar among the three major groups.
  - However, **patients who developed complications had a significantly higher mean and median of total hospital stay within all three groups** (p<0.05).

CONCLUSION

1. Admission of **good-grade aSAH in a non-ICU may be safe** and is similar in the ICU in terms of mortality rate and functional outcome at discharge.
2. Admission in the **non-ICU** may also **decrease** the probability of developing **nosocomial infection.**
3. **Rebleeding** is more frequent in the **non-ICU**.
4. The **development of these complications** is a predictor of **unfavorable outcome** and **mortality**, and is consequently associated with **longer hospital stay.**

Therefore, all efforts should be directed in the prevention and management of both neurologic and non-neurologic complications of good-grade aSAH.

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