

Introduction

- Disorders of consciousness (DoC) can be a result from extremely severe brain injuries caused by a traumatic or an anoxic event.
- The common hypnotics Ambien and/or Ativan have been reported to demonstrate a paradoxical response; however, phenotypical characteristics of the responders are still unknown.
- Further investigation into this phenomenon could help guide medication decisions in the future for patients with a DoC.

Methods

- Objective:** To investigate the results of Ambien and Ativan trials in persons with DoC resulting from a traumatic or anoxic event.
- Design:** A retrospective chart review
- Setting:** Inpatient rehabilitation
- Participants:** Patients admitted to a DoC rehabilitation program in 2014-2018
- Response characteristics:**
 - Positive:** patient responded to the trial medication with prominent improvement in physical or cognitive functions, leading to routine use of the medication (responder)
 - Negative:** non-responders had equivocal or negative (i.e., went to sleep) responses

Results

❖ Overall results

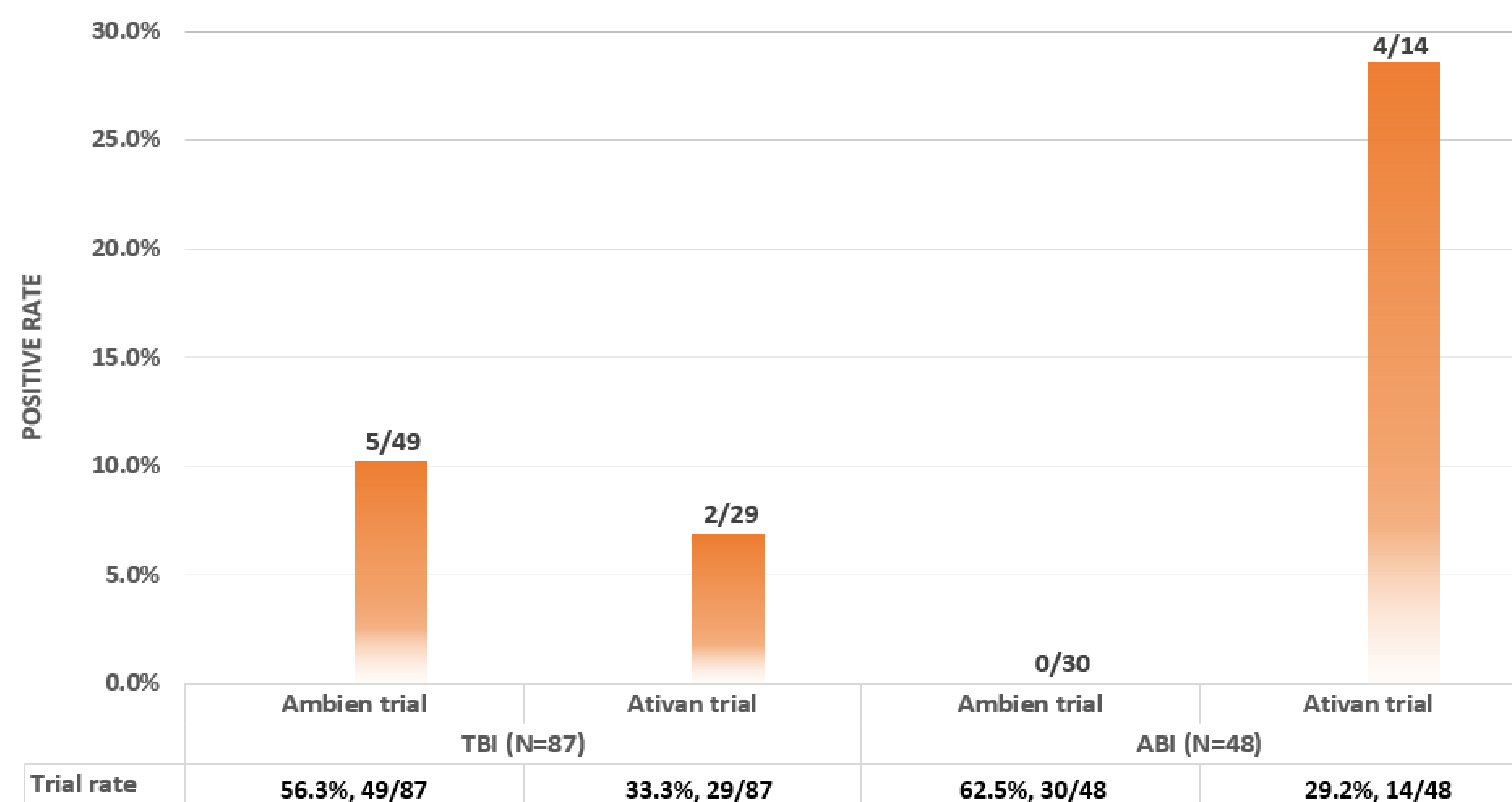
- A total of 135 DoC patients were reviewed
- 87 patients with a TBI, 48 with an ABI
- 68 patients received a trial of either Ambien or Ativan, 27 received both, 40 received neither.
- Overall positive rate for the Ambien trial was 6.3% (5/79), and for the Ativan trial 14.0% (6/43; $p = 0.192$).
- Responders to either medication had a higher likelihood of achieving emergence (9/11, 81.8% vs. 39/84, 46.4%, $p = 0.051$).

❖ Based on the mechanism of injury

- For TBI patients, the positive rate in the Ambien trial (10.2%, 5/49) was not significantly different from that in the Ativan trials (6.9%, 2/29; $p > 0.05$).
- For ABI patients, the positive rate was significantly higher in the Ativan trial (4/14, 28.6%) than in the Ambien trial (0/30, 0%; $p = 0.007$)

❖ Responder characteristics

- In general, responders were younger than non-responders in both medication trials.
- Other characteristics (gender, time since injury on admission, diagnosis on admission) were largely indistinguishable between the responders.



Discussion

- We observed a similar positive rate to Ambien in TBI-related DoC patients, about 10%, as in the previous prospective studies.
- Surprisingly, ABI-related DoC patients had a nearly 30% response rate to Ativan. No similar studies could be found to make comparison.
- The Ambien and Ativan trials are relatively safe and inexpensive. When effective at an individual level, it may exert a life-changing impact on the person's functionality, recovery trajectory, and rehabilitation resources one may receive in the long run.

Conclusions

- ✓ Considering the very limited treatment options currently available for persons with DoC, we would like to advocate for screening all DoC patients with Ambien and/or Ativan when medically stable.
- ✓ The etiology of DoC may be worth noting in designing the trial regimen and future studies.
- ✓ An observatory cohort with a larger sample size may be needed to confirm these findings and identify the characteristics of the responders.