Correlating anti-cholinergic cognitive burden with fall risk in hospitalized patients

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Background

Froedtert Hospital is currently implementing a multicomponent delirium prevention protocol based on best practices outlined by the National Institute for Health and Care Excellence. As of June 2023, the current rollout phase identifies certain high-risk medications used in hospitalized patients with a high anticholinergic burden (ACB) that may contribute to delirium and falls. A high anticholinergic burden has been associated with adverse outcomes such as delirium, but no strong association has yet been identified between falls and ACB in the hospitalized adult population.

Hypothesis

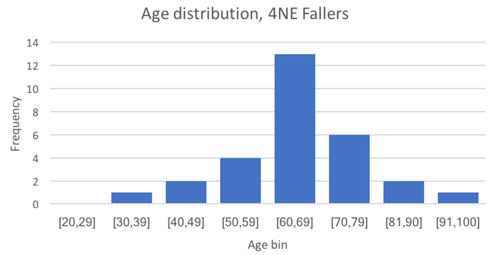
We hypothesize that a high anticholinergic drug burden will positively correlate with increased falls in the hospitalized population.

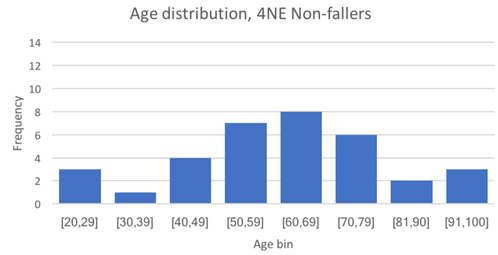
Methods

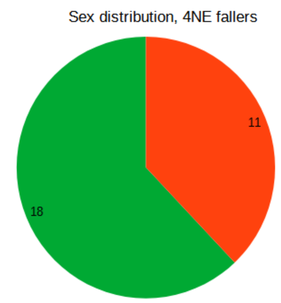
To determine the relationship between ACB and fall risk, we retrospectively reviewed cumulative ACB scores and the incidence of falls (defined by severity) in patients hospitalized on a single acute care medical unit (4NE) unit at Froedtert Hospital from July 2022 to July 2023. Subjects were split into fallers and non-fallers. Non-fallers were randomly selected from 4NE patients who did not experience a fall but were hospitalized on the same day that a corresponding fall from the fall group occurred. ACB scores in the fall group were calculated over the 24-hour period prior to the fall. ACB scores in the non-fall group were calculated over a 24-hour period from 12:00a - 11:59p, either on the same date of the corresponding fall from which they were selected or on the first full inpatient day, whichever was later.

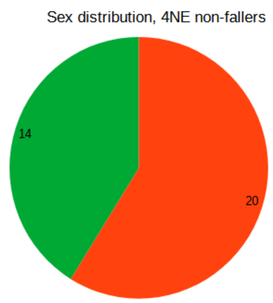
Results

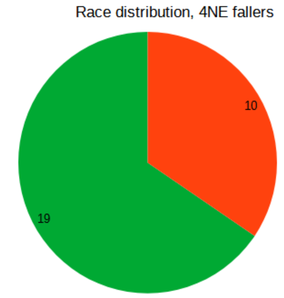
There were 37 falls from July 2022 - July 2023 in the 4NE unit. Of those, there were 29 unique patients, with 2 patients experiencing more than one fall. 62.1% of fallers were male and 37.9% were female. Mean ACB score for patients in the 24 hours prior to fall was 2.514 with a standard deviation of 2.512. 24.3% of fallers had an ACB score of 0. There were 34 subjects in the non-faller group. 41.2% of non-fallers were male and 58.8% were female. Mean ACB score for non-fallers over 24-hour periods corresponding to fall dates in the fall group was 1.412 with a standard deviation of 2.047. 47.1% of non-fallers had an ACB score of 0.

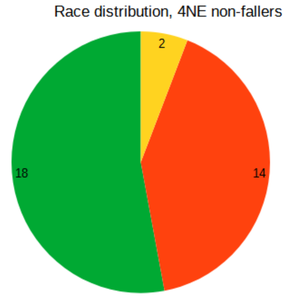


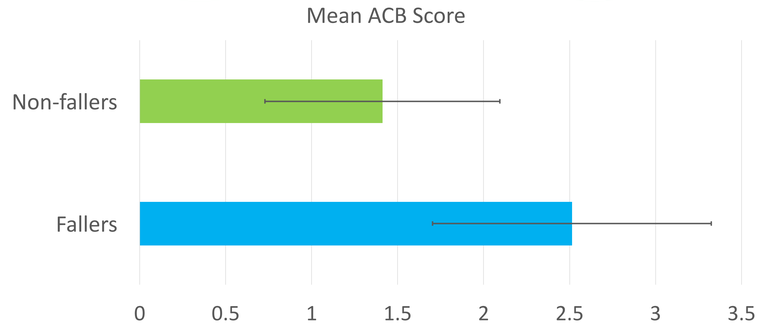












Discussion

ACB scores in the faller group were significantly higher than those in the non-faller group (p=.024). Removing falls after the first for patients who fell more than once resulted in a small sample size (n=29) but average ACB score remained significantly higher (p=.046). There was no significant difference for age, sex, or race between groups.

Future Work

Follow-up studies will attempt to control for additional variables that may contribute to falls in hospitalized patients (mobility level, severity of illness, age, delirium, etc.), expand to more medical units at Froedtert, and encompass a larger retrospective time frame. Pharmacy consult data is not available at this time, but will be collected to study whether there is a correlation between falls and pharmacy consult. Future study will also observe whether the rollout of a multicomponent delirium prevention protocol had effect on fall rates or ACB score.

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