



A descriptive analysis of pharmacological management of aggression and/or agitation in patients with traumatic brain injury in a Southwest Virginia inpatient population.

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INTRODUCTION

Traumatic Brain Injury (TBI) is a major cause of disability, and it has been associated with agitation and aggression (1,2). In a previous study, we reviewed the literature to identify evidence-based pharmacological treatments for treatment of agitation in TBI (3). Based on the results of our previous study, the use of haloperidol and benzodiazepines is not supported by the available evidence while the use of beta blockers, amantadine, antiepileptics and methylphenidate is supported by the limited available evidence. In this study, we describe the psycho-pharmacological agents that are administered to patients with agitation and/or aggression in the context of TBI in inpatient facilities of a private, non-profit health care system in Southwest Virginia. We will also compare the psycho-pharmacological agents ordered before and after psychiatric consultation.

Acute Management

Avoid benzodiazepines and typical antipsychotics (specifically haloperidol) if possible (C).

Atypical antipsychotics (such as olanzapine) can be considered as practical alternatives (C-D).

Long-Term Preventative Management

Recommend considering amantadine (especially in the context of chronic TBI) (B) and propranolol (particularly in the context of acute TBI) (B). Suggest considering methylphenidate (C), and antiepileptics (C).

B, GRADE B evidence; C, GRADE C evidence; D, GRADE D evidence

Methods

Adult patients who were admitted to Carilion Clinic's inpatient facilities from March 30, 2013 to March 30, 2018, had a diagnosis of TBI and received psychiatric consultation for agitation and/or aggression were enrolled in this study. A retrospective review of electronic medical records was conducted by researchers and data was collected on the following measures: ordered psycho-pharmacological agents, frequency, dosing, and duration of orders, whether each administered psycho-pharmacological agent was started before or after psychiatric consultation, and psycho-pharmacological agents prescribed upon discharge.

Results

About 68% of patients were started on benzodiazepines and/or typical antipsychotics and 23% of patients were subsequently discharged on these medication categories. Only 23% of patients were ordered to receive medications supported by the evidence such as amantadine, beta blockers or antiepileptics. The percentage of patient-days with an order to receive typical antipsychotics significantly decreased following psychiatric consultation (P = 0.0056) but the percentage of patients-days with an order to receive benzodiazepines significantly increased following psychiatric consultation (P = 0.0001)

Table 1. Baseline Characteristics.

Variable	All Patients	Recommended Long Term Medications	No Recommended Long-Term Medications
Age Mean (SD)	50.13 (17.21)	51.21 (16.54)	48.42 (18.85)
Gender	9 Female, 22 Male	4 Female, 15 Male	5 Female, 7 Male
Race	30 Caucasian 1 African American	18 Caucasian 1 African American	12 Caucasian
LOS Median [IQR]	10.99 [4.89, 26.12]	17.07 [7.09, 26.77]	7.93 [3.38, 17.50]
TBI Severity	8 Mild, 13 Moderate, 6 Severe, 4 unknown	3 Mild, 9 Moderate, 5 Severe, 2 unknown	5 Mild, 4 Moderate, 1 Severe, 2 unknown

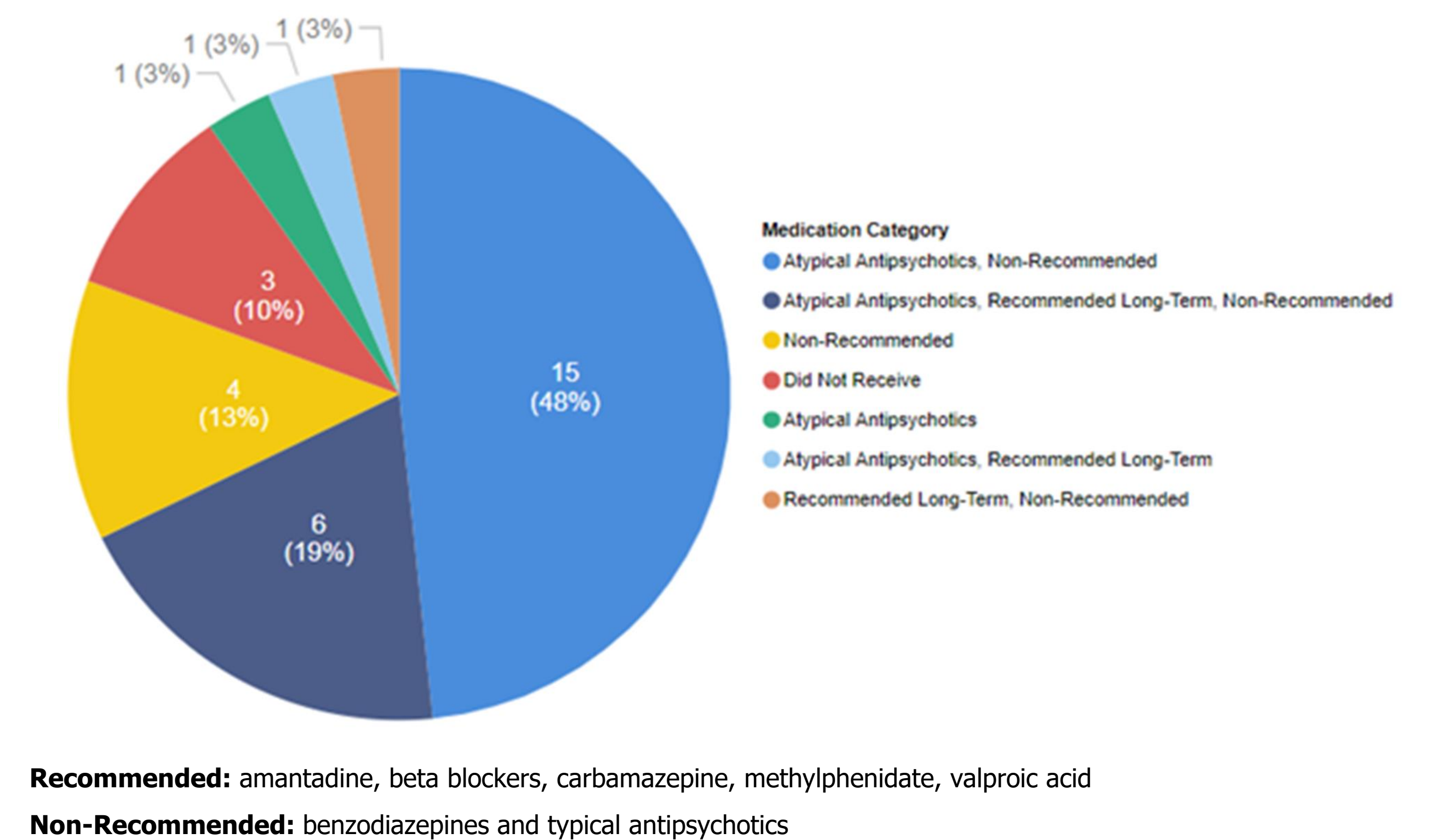
Table 2. Patient-days each medication group was prescribed.

Medication group	Patient-days this medication was ordered	Before psych consult	After psych consult	P value
Non-Recommended	215/591 = 36%	63/222 = 28%	152/369 = 41%	0.0023
Benzodiazepines (except Midazolam)	182/591 = 31%	47/222 = 21%	135/369 = 37%	0.0001
Typical Antipsychotics	58/591 = 10%	32/222 = 14%	26/369 = 7%	0.0056
Recommended	212/591 = 36%	83/222 = 37%	129/369 = 35%	0.6118
Atypical Antipsychotics	200/591 = 34%	78/222 = 35%	122/369 = 33%	0.6701
Long-Term Recommended	102/591 = 17%	37/222 = 17%	65/369 = 18%	0.8547
Valproic Acid	83/591 = 14%	27/222 = 12%	56/369 = 15%	0.3686
Amantadine	31/591 = 5%	15/222 = 7%	16/369 = 4%	0.2767
Beta Blockers	15/591 = 3%	8/222 = 4%	7/369 = 2%	0.3137
Methylphenidate	4/591 = 1%	0/222 = 0%	4/369 = 1%	1

Table 3. Percentage of patients who were started on and discharged on each medication group

Medication group	Percentage of patients started on this medication	Percentage of patients discharged on this medication
Non-Recommended	21/31 = 68%	7/31 = 23%
Benzodiazepines (except Midazolam)	17/31 = 55%	6/31 = 19%
Typical Antipsychotics	14/31 = 45%	2/31 = 6%
Recommended	19/31 = 61%	10/31 = 32%
Atypical Antipsychotics	19/31 = 61%	10/31 = 32%
Long-Term Recommended	7/31 = 23%	3/31 = 10%
Valproic Acid	6/31 = 19%	4/31 = 13%
Carbamazepine	0/31 = 0%	0/31 = 0%
Amantadine	3/31 = 10%	2/31 = 6%
Beta Blockers	1/31 = 3%	0/31 = 0%
Methylphenidate	1/31 = 3%	1/31 = 3%

Figure 1. Percentage of patients who received each group of psycho-pharmacological agents.



Discussion

This study demonstrates the widespread use of typical antipsychotics and benzodiazepines in management of agitation in TBI and the importance of multidisciplinary collaboration, research, and education of providers to improve patient care.

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