Pharmaceutical Management of Post-TBI Neuropsychiatric Symptoms

Definitions

1. Depression: TBI-associated depression is characterized by prolonged, persistent sadness associated with other symptoms such as anhedonia, lack of motivation, decreased self-care, variable sleep and/or appetite pattern, feelings of hopelessness, and/or suicidal thoughts. These symptoms may last for a couple of weeks to months (major depressive episode) or persist in a milder form for two or more years (dysthymia).

2. Mania/Agitation: Subtype of delirium unique to TBI which occurs during period of Post traumatic amnesia (PTA – period of time in which new memory formation is impaired), characterized by excess of behavior that includes some combination of aggression, disinhibition, akathisia, disinhibition, and emotional liability IN ABSENCE of other physical, medical or psychiatric causes.

3. Anxiety: A wide range of anxiety disorders may occur after TBI including generalized anxiety disorder, agoraphobia, social phobia, panic disorder, and obsessive-compulsive disorder.

4. PTSD: Symptoms may include nightmares or unwanted memories of the trauma, avoidance of situations that bring back memories of the trauma, heightened reactions, anxiety, or depressed mood.

5. Psychosis: There are predominantly 2 types of TBI-related psychosis: delusional disorders and schizophrenia-like psychosis.

6. Sleep disturbance: Sleep disturbances are common after TBI and can occur in isolation or as a symptom of a psychiatric disorder. Insomnia is the most common sleep disturbance, seen in about 50% of patients with TBI, although other disturbances such as hypersomnia, sleep apnea, and sleepwalking may also be present.

7. Executive function deficits: The constellation of cognitive impairments following TBI is variable and depends on the severity of the location of the injury on the brain. TBI can affect every cognitive domain, including attention, memory, visual-spatial processing, language, social cognition, and executive functioning.

Assessment and Diagnosis

1. Mania/Agitation- Agitated Behavior Scale where 22-28 is mild agitation, 29-35 is moderate agitation, and 36-56 is severe agitation.

2. Depression- PHQ 9 where 1-4 is minimal depression, 5-9 is mild depression, 10-14 is moderate depression, 15-19 is moderately severe depression and 20-27 is severe depression

3. Anxiety: GAD-7 where 0-4 is minimal anxiety, 5-9 is mild anxiety, 10-14 is moderate anxiety, and 15-21 is severe anxiety

4. PTSD: ITSS where PTSD is evaluated in items 3, 4, 7, 8, 9 and Depression is evaluated in items 1, 2, 3, 5, 6. If the sum of questions 1, 2, 3, 5, and 6 is equal to or greater than 2, the screen is positive for PTSD risk. If the sum of questions 3, 4, 7, 8 and 9 is equal to or greater than 2, the screen is positive for depression risk.

5. Memory deficits, executive function deficits, and inattention: consult Speech Therapy for cognitive evaluation

Pharmacologic Management

General Considerations for all patients:

Propranolol - Patients with TBI by CT and GCS <12, hemodynamically stable at 24 hrs after admission (BP>100, not requiring vasopressor or blood transfusion) should be started on propranolol 20 mg po q12hrs . If patient develops bradycardia (HR<50 bpm) or hypotension (SBP <100mmHg), then propranolol should be stopped. Increase the dose from 20 mg BID to 40 mg BID based upon SBP>140s, and HRs> 110-120s. (Of note, if BP remains high, consider adding another agent). Propranolol should be stopped upon discharge or after 7 days, whichever is sooner.

In patients on home beta-blockers (for hypertension, heart failure, afib rate control), switch to propranolol temporarily and stop the home beta blocker (avoid ordering 2 beta blockers on the same patient). Propranolol dose can be titrated up if needed for BP or HR) or a second antihypertensive ordered.

Clonidine – has unclear role for use in TBI patients for agitation or storming. Its use as adjunct therapy in withdrawal syndromes is longstanding. It is explored for use as a transition-off agent in patients on dexmedetomidine and as an adjunct in treating PSH. Thus, practical uses for clonidine include: treating agitation in conjunction with withdrawal syndromes, treating agitation/delirium in a patient weaning off dexmedetomidine or whom dexmedetomidine was effective, 3-4th line in PSH (after gabapentin, opiates, benzos have been tried/considered). Initial dosing should be 0.1 mg PO TID. If patient is already on dexmedetomidine, the dose can be started at 0.2-0.3 mg TID and the dexmedetomidine can be decreased. Side effects include: hypotension, rebound hypertension, withdrawal.

Antipsychotics and stimulants– Generally for short-term use, should be tapered when symptoms resolve. Use assessment tools prior to initiation of pharmacologic agents to ensure you are treating the correct symptom.

All new antipsychotics and stimulants should be reviewed and weaned (if possible) at time of transfer from ICU to floor, and again, at time of discharge from hospital.

Psychiatric problems	Assessment tool	First line medications	Standard dosage	Common adverse effects
Depression	PHQ 9	Sertraline	Start: 25 or 50 mg daily. May double dose after 1 week, assess for effect in 4 weeks before further increasing.	Nausea, diarrhea, sexual dysfunction
Manic: acute	Agitated Behavior Scale	Quetiapine	Start: 25-50 mg BID Increase to effect to maximum of 400 mg/day	Sedation, Parkinsonism, weight gain, QTc prolongation
Mania: maintenance	Agitated Behavior Scale	Valproate	Start: 250 mg TID May load with 15 mg/kg for rapid symptom control May increase every 2-3 days, checking level to ensure not above range	Hepatotoxicity, hyperammonemia, thrombocytopenia, drug interaction with carbapenems Safe therapeutic range: 50-125 mcg/mL
Anxiety	GAD-7	Sertraline	Start: 25 mg daily May double dose every 2 weeks until 100 mg daily reached. Assess in 4 weeks before further increasing.	Nausea, diarrhea, sexual dysfunction Low dosing to avoid worsening anxiety during initiation period
PTSD	ITSS	Sertraline or paroxetine	Sertraline Follow anxiety dosing Paroxetine Start: 20 mg daily, may increase in 10 mg increments per week up to 60 mg daily.	Nausea, diarrhea, sexual dysfunction Paroxetine has higher sedating effect.

Psychosis		Risperidone or quetiapine	Quetiapine Acute dose: 25 mg If scheduled dose indicated, same as above. Risperidone Acute dose: 1-2 mg, up to 6 mg in 24 hours	Parkinsonism, sedation
Apathy		Methylphenidate	Start: 5 mg BID	Agitation, anxiety, insomnia, palpitations, tachycardia
Sleep disturbance		Melatonin 2nd line: Trazodone	Melatonin 3-9 mg nightly Trazadone 50 mg nightly	Daytime drowsiness, sensory distortion, sleep walking
Executive function deficits	Consult Speech Therapy for cognitive evaluation	Amantadine	Start 100 mg BID May increase in 50 mg increments weekly to max of 200 mg BID	Headache, nausea, diarrhea, insomnia, orthostasis, psychosis at high doses
Inattention	Consult Speech Therapy for cognitive evaluation	Methylphenidate	Start: 5 mg BID, start >7-10 days post injury	Agitation, anxiety, insomnia, palpitations, tachycardia

Appendix A: Agitated Behavior Scale where 22-28 is mild agitation, 29-35 is moderate agitation, and 36-56 is severe agitation.

AGITATED BEHAVIOR SCALE

Patient _____ **Period of Observation:**

Observ. Environ._____ **From:**_____ **a.m.** **p.m.**_____/_____/_____

Rater/Disc._____ **To:**_____ **a.m.** **p.m.**_____/_____/_____

At the end of the observation period indicate whether the behavior described in each item was present and, if so, to what degree: slight, moderate or extreme. Use the following numerical values and criteria for your ratings.

1 = absent: the behavior is not present.
2 = present to a slight degree: the behavior is present but does not prevent the conduct of other, contextually appropriate behavior. (The individual may redirect spontaneously, or the continuation of the agitated behavior does not disrupt appropriate behavior.)
3 = present to a moderate degree: the individual needs to be redirected from an agitated to an appropriate behavior, but benefits from such cueing.
4 = present to an extreme degree: the individual is not able to engage in appropriate behavior due to the interference of the agitated behavior, even when external cueing or redirection is provided.

DO NOT LEAVE BLANKS.

_____ 1. Short attention span, easy distractibility, inability to concentrate.
_____ 2. Impulsive, impatient, low tolerance for pain or frustration.
_____ 3. Uncooperative, resistant to care, demanding.
_____ 4. Violent and or threatening violence toward people or property.
_____ 5. Explosive and/or unpredictable anger.
_____ 6. Rocking, rubbing, moaning or other self-stimulating behavior.
_____ 7. Pulling at tubes, restraints, etc.
_____ 8. Wandering from treatment areas.
_____ 9. Restlessness, pacing, excessive movement.
_____ 10. Repetitive behaviors, motor and/or verbal.
_____ 11. Rapid, loud or excessive talking.
_____ 12. Sudden changes of mood.
_____ 13. Easily initiated or excessive crying and/or laughter.
_____ 14. Self-abusiveness, physical and/or verbal.

_____ **Total Score**

Appendix B: PHQ 9 where 1-4 is minimal depression, 5-9 is mild depression, 10-14 is moderate depression, 15-19 is moderately severe depression and 20-27 is severe depression

Over the last 2 weeks, how often have you been bothered by the following problems?		Not at all	Several Days	More than half the days	Nearly every day
1	Little interest or pleasure in doing things	0	1	2	3
2	Feeling down, depressed, or hopeless	0	1	2	3
3	Trouble falling asleep or sleeping too much	0	1	2	3
4	Feeling tired or having little energy	0	1	2	3
5	Poor appetite or overeating	0	1	2	3
6	Feeling bad about yourself- or that you are a failure or have let yourself or family down	0	1	2	3
7	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8	Moving or speaking so slowly that other people could have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9	Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
	TOTAL SCORE (add the marked numbers):				

Appendix C: GAD-7 where 0-4 is minimal anxiety, 5-9 is mild anxiety, 10-14 is moderate anxiety, and 15-21 is severe anxiety

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Total Score ___ = Add Columns ___ + ___ + ___

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Appendix D: ITSS where PTSD is evaluated in items 3, 4, 7, 8, 9 and Depression is evaluated in items 1, 2, 3, 5, 6. If the sum of questions 1, 2, 3, 5, and 6 is equal to or greater than 2, the screen is positive for PTSD risk. If the sum of questions 3, 4, 7, 8 and 9 is equal to or greater than 2, the screen is positive for depression risk.

Injured Trauma Survivor Screen (ITSS)

1 = Yes 0 = No

Before this injury	PTSD	DEP
1. Have you ever taken medication for, or been given a mental health diagnosis?		1 0
2. Has there ever been a time in your life you have been bothered by feeling down or hopeless or lost all interest in things you usually enjoyed for more than 2 weeks?		1 0
When you were injured or right afterward		
3. Did you think you were going to die?	1 0	1 0
4. Do you think this was done to you intentionally?	1 0	
Since your injury		
5. Have you felt emotionally detached from your loved ones?		1 0
6. Do you find yourself crying and are unsure why?		1 0
7. Have you felt more restless, tense or jumpy than usual?	1 0	
8. Have you found yourself unable to stop worrying?	1 0	
9. Do you find yourself thinking that the world is unsafe and that people are not to be trusted?	1 0	
≥ 2 is positive for PTSD risk ≥ 2 is positive for Depression risk SUM =		

Authors:

Charity Evans, Abby Josef Trauma and Acute Care Surgery

Becca Sedlak, Pharmacy

Last Updated: January 2024

Revision #3
Created 11 January 2024 15:59:36 by Abby Josef
Updated 12 February 2026 15:49:39 by Abby Josef