MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Explosive Behavior in Children and Adolescents

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Disclosures

Neither I nor my spouse/partner has a relevant financial relationship with a commercial interest to disclose.

Outline

- Definition
- Morbidity
- Differential Diagnosis
- Treatment algorithms for acute and chronic aggression
- Summary of medication recommendations for aggression

Explosive Behavior

- Angry, aggressive, or violent outbursts
- May include verbal and/or physical aggression
- Can be due to a triggering event, or can come out of nowhere
- Often occurs in the context of an underlying medical or psychiatric problem that is causing or exacerbating the behavior

Explosive Behavior - Morbidity

- Poses safety risks
- Disrupts home life, school functioning and peer relationships
- Can impair emotional development
- Increased risk of delinquency
- Can lead to poor physical and mental health
- Has been linked to the development of substance abuse problems

Management of Explosive Behavior

- Step 1: Conduct a thorough initial evaluation, including both a psychiatric and medical evaluation.

Explosive Behavior – Medical concerns

- Consider medical workup if behavior is new or has a sudden onset
- Seizures
- Infection
- Traumatic Brain Injury
- In young children, and in youth who are nonverbal, have intellectual disability, Autism Spectrum Disorders, or have difficulty communicating, additional medical issues should be evaluated for: constipation, ear infection, anything that may be causing pain (ie, hair tourniquet)

Psychiatric Differential Diagnosis of Explosive Behavior

- Mood Disorders
  - Bipolar Disorder
  - Disruptive Mood Dysregulation Disorder
  - Depressive Disorder
- Disruptive Behavior Disorders
  - ADHD
  - Oppositional Defiant Disorder
  - Conduct Disorder
- Anxiety Disorders
- PTSD
- Autism Spectrum Disorder
- Tic disorders
- Tourette Syndrome
- Substance Abuse
- Learning Disabilities
- Intellectual Disability

Mood and Anxiety Disorders

- Negative, abnormal or mixed emotional state (sad/depressed, irritable, anxious, euphoric) that may be notably different than baseline and that persist outside of explosive episodes
- Accompanying symptoms suggestive of a mood or anxiety disorder (changes in sleep, appetite, energy, functioning, excessive worries)
- Explosive behavior is often triggered by something but may come out of nowhere

Disruptive Behavior Disorders

- Emotional impulsivity
- Deficient self-regulation
- Emotional outbursts are typically triggered by something, often limit setting, restrictions around preferred activities, or being asked to engage in a non-preferred activity
- Explosions may be perceived as manipulative, or used for the child to get what they want/need (ODD/CD)
- Explosions are out of proportion compared with what would be expected

Autism Spectrum Disorder

- Up to 20% of patients with ASD can display irritability and aggressive behavior (towards self and others)
- Longstanding social difficulties and/or lack of social motivation (ie, difficulty making or keeping friends)
- Restricted, repetitive patterns of behavior
- Difficulty with transitions, inflexibility, rigidity around schedules, need for routines, “sameness”; changes in these things can cause explosions
- Sensory issues can also lead to explosive behavior
- New explosive behavior in a child with ASD – requires a medical evaluation for new medical problems (ear infection, constipation, UTI, etc)

Post Traumatic Stress Disorder

- History of trauma
- Negative cognitions and mood
- Increased arousal: feeling keyed up, on edge or irritable
- Explosive behavior may be triggered by situations that remind the patient of the traumatic event

Tourette Syndrome

- 25% of children with TS have rage episodes
- Rage episodes escalate very quickly, are out of proportion to triggering event and can be very destructive
- No persistent mood issues between explosive episodes
- Often associated with ADHD, Tics and OCD

Treatment of Explosive Behavior

- Step 1: Conduct a thorough initial evaluation, including diagnostic workup.
- Step 2: Initiate treatment based on evidence for first-line psychosocial, therapeutic, and psychopharmacological management for the identified diagnoses.

Acute Aggression

1. Perform a risk assessment and refer for emergency evaluation if necessary.
2. Use psychosocial crisis management techniques before medication.
3. If necessary, utilize pharmacological management of acute aggression prior to resorting to physical and mechanical restraints.
4. If "stat" or "PRN" medications are frequently required, readjust the behavioral treatment plan and medication regimen.

Chronic Aggression

1. Psychosocial and educational treatment (psychotherapy – individual and family, behavior plan, IEP/504 plan at school if needed).
2. Start/optimize pharmacological treatment for primary disorder(s).

Therapy

- Parent Management Training
- Parent Child Interaction Therapy
- Cognitive Behavioral Therapy
- Social-Emotional Training
- Collaborative Problem Solving
- Dialectical Behavioral Therapy
- Applied Behavioral Analysis

Chronic Aggression

1. Psychosocial and educational treatment (psychotherapy – individual and family, behavior plan, IEP/504 plan at school if needed).
2. Start/optimize pharmacological treatment for primary disorder(s).
3. If no benefit, consider an antipsychotic. Start with a second generation antipsychotic (SGA), because they have a safer acute side effect profile than first generation antipsychotics (FGAs). Use a conservative dosing strategy: start low, go slowly, routinely assess for side effects and drug interactions, ensure an adequate trial (at least 2 weeks), and avoid using 4 or more medications simultaneously.
4. If no response, try a different SGA.
5. If partial response, consider augmentation with a mood stabilizer.
6. If good response, continue treatment for 6 months and then attempt to taper if tolerated.

Medication Management of Explosive Behavior

- Second generation antipsychotics (SGAs) have the most evidence.
  - **Risperidone** (0.5 – 4mg)
  - Aripiprazole
- Side effects of SGAs include weight gain, sedation, elevated cholesterol, increased risk of developing type II diabetes, metabolic syndrome.
- Lab work should be obtained prior to starting the medications and at regular intervals while the patient is taking the medication (HbA1c, fasting lipid panel). Weight should be monitored. EKG may be appropriate if any cardiac concerns as they may increase QT interval.

Table 1
Summary of studies on all medication classes

	Number of Total Studies	Types of Studies	Length of Studies	Review of Data
SGAs				
Risperidone[7–17]	11	6 double-blind, placebo-controlled trials 1 open-label trial 1 longitudinal study 1 naturalistic study 2 meta-analyses	4 wk to 12 mo	All 11 studies show reductions in aggression, irritability, conduct problems, and/or temper outbursts
Aripiprazole[18–27]	10	3 double-blind, placebo-controlled trials 3 open-label trials 1 case series 1 retrospective chart review 1 post hoc analysis 1 review article	6–52 wk	8 studies show efficacy in treating irritability associated with ASD 2 studies show improvements in irritability, aggression, disruptive behaviors, or explosive outbursts 1 study indicates tolerability, although 22% discontinued treatment
Olanzapine[28–31]	4	3 open-label trial 1 case report	2–12 wk	All 4 studies show improvements in aggression or explosive rage 1 study indicates a high discontinuation rate because of side effects
Ziprasidone[32–37]	6	2 case series 4 retrospective chart reviews	6–30 wk	4 studies show beneficial effects on aggression and agitation Compared with other medications, 1 study does not show any beneficial effects and 1 study shows worse outcomes
Quetiapine[38,39]	2	1 open-label trial 1 post hoc analysis	4–8 wk	Both studies show a reduction in aggression 1 study indicates good tolerability
Lurasidone[40]	1	1 double-blind, placebo-controlled trial	6 wk	Found no benefit compared with placebo for irritability in ASD

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Medication Management of Explosive Behavior

- Some evidence for the use of mood stabilizers (Lithium, Depakote).
- Stimulants have evidence for treating mood dysregulation in children with ADHD (should not be initiated unless the clinician is confident that the child does not have a primary mood disorder).
- Limited evidence for the use of alpha agonists.

Table 1
(*continued*)

	Number of Total Studies	Types of Studies	Length of Studies	Review of Data
FGAs[1,41–45] 1 multiple FGAs 1 haloperidol 1 haloperidol and thioridazine 1 molindone and thioridazine 1 thioridazine 1 droperidol	6	2 double-blind, placebo-controlled trials 1 double-blind comparison trial 1 meta-analysis 1 retrospective chart review 1 review article	3–8 wk	1 study found insufficient evidence for conduct problems or irritability in ASD 5 studies indicate efficacy for aggression and CD 1 study notes a greater effect size for haloperidol compared with thioridazine 2 studies note considerable side effects
Lithium[41,48–52]	6	5 double-blind, placebo-controlled trials 1 longitudinal study	2 wk to 10 y	4 studies indicate beneficial effects on aggression or symptoms of CD 2 studies show no beneficial effects in CD or SMD 1 study notes fewer side effects than haloperidol and 1 study notes more side effects than placebo
Antiepileptics				
Divalproex sodium[39,53–58]	7	3 double-blind, placebo-controlled trials 1 double-blind, controlled trial 1 open-label trial 2 post hoc analyses	4–12 wk	6 studies indicate beneficial effects on aggression, irritability, mood lability, or symptoms of CD, alone or as adjunctive treatment 1 study shows efficacy for treatment of impulsivity, but not aggression
Carbamazepine[95,96]	2	1 double-blind, placebo-controlled trial 1 open-label trial	3–6 wk	1 study shows an improvement in aggression and explosiveness 1 study indicates no beneficial effects compared with placebo and more side effects Small N for both studies

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Stimulants[12,13,63–71] 4 multiple stimulants 7 methylphenidate	11	6 double-blind, placebo-controlled trials 3 open-label trials 1 naturalistic study 1 meta-analysis	1 d to 6 mo	11 studies show efficacy for aggression, oppositional behaviors, ADHD symptoms, antisocial behaviors, externalizing symptoms, irritability, emotional lability, anger, and/or explosive rage, alone or combined with an SGA or behavior therapy 1 study noted improvement in aggression in less than half (49%) of participants 1 study noted worsened irritability in 19% of participants
Alpha agonists[72–75] 2 clonidine 2 guanfacine	4	2 double-blind, placebo-controlled trials 1 open-label trial 1 case report	6 wk to 18 mo	All 4 studies show improvements in aggression, conduct-related behaviors, oppositional behaviors, or symptoms of ASD, including impulsivity and self-injurious behavior, either alone or combined with a stimulant
Atomoxetine[2,97]	2	2 meta-analyses	6 wk to 9 mo	1 study shows reductions in symptoms of ODD and ADHD 1 study indicates a small effect size for aggression
Antidepressants[43,76–86] 1 multiple antidepressants 1 multiple SSRIs 2 citalopram 2 fluoxetine 1 fluvoxamine 1 nortriptyline 2 desipramine 2 trazodone	12	6 double-blind, placebo-controlled trials 3 open-label trials 2 case reports 1 meta-analysis	1–16 wk	7 studies show improvements in aggression, oppositional symptoms, impulsivity, or OCD, alone or combined with stimulants 1 study noted a small effect size of antidepressants on aggression, with desipramine as the largest 3 studies note no therapeutic benefit on aggression or functional impairment 1 study indicates that some may worsen on trazodone

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Table 1
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	Number of Total Studies	Types of Studies	Length of Studies	Review of Data
Antihistamines[98,99] 1 all antihistamines 1 diphenhydramine	2	1 double-blind, placebo-controlled trial 1 retrospective chart review	2 h	1 study notes a high frequency of use for the management of aggressive events 1 study indicates no beneficial effects compared with placebo
Vitamins/minerals[87–94] 2 omega-3 fatty acids 4 EMPower family 2 other vitamins/minerals	8	3 double-blind, placebo-controlled trials 1 single-blind, controlled trial 1 open-label trial 2 case series 1 naturalistic study	8 wk to 6 mo	All 8 studies show improvements in aggression, mood, angry outbursts, irritability, emotional regulation, and/or violent behaviors

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Conclusions

- Perform a thorough diagnostic evaluation, investigating both medical and psychiatric causes of explosive behavior
- Initiate medications and psychosocial interventions to treat the primary diagnosis (medical and/or psychiatric) first
- If ongoing explosive or aggressive behavior, consider atypical antipsychotics as first line

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