Behavioral Interventions for Anxiety and Irritability in Children and Adolescents with Autism Spectrum Disorder

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Autism Spectrum Disorder (ASD)

• Core symptoms
  – Impairment in social interaction and communication
  – Restricted interests and repetitive behavior

• Associated features
  – Cognitive impairment
  – Deficits in adaptive functioning
  – Anxiety
  – Disruptive behavior problems
Anxiety in ASD

- Excessive fearfulness
- Changes in routines and social situations
- Can be related to core ASD symptoms
- Co-occurring anxiety disorders may be present
- Social anxiety may be difficult to diagnose
- Contributes to impairment in functioning
Cognitive-Behavior Therapy for Anxiety

CBT is a well-established intervention for anxiety in children without autism.

Key components: education, emotion regulation, and exposure and response prevention.

Short-term duration, 8 to 16 weekly sessions.

Treatment is conducted with the child and includes parent involvement.
Is CBT helpful for anxiety in ASD?

Main Findings:

- 8 randomized controlled studies of CBT for anxiety were located.
- CBT was superior to waitlist on parent and clinician-rated anxiety.
- Effect sizes were 1.19 for parent ratings, 1.21 for clinician ratings and 0.68 for child self-report.

Sukhodolsky, Bloch, Panza, Reichow *Pediatrics*, 2013
Neural Mechanisms of CBT for anxiety in ASD

Subjects:
• 10 children with ASD and anxiety (3 girls, 7 boys),
• Age range from 10 to 13 years old
• Full Scale IQ ranged from 79 to 122
• Score ≥ 19 on the child symptom inventory anxiety scale
• 4 unmedicated and 6 on stable medication

Treatment:
• 12-15 sessions of CBT for anxiety (Woods et al, 2009)

Outcomes:
• Clinician-rated Pediatric Anxiety Rating Scale (PARS)
• fMRI with emotion regulation and face perception tasks
Exposure and response prevention

Social fears:

“Being rejected or offended in front of other children”

“I feel I will be embarrassed somehow…”

Exposure hierarchy:

• Arrive to school 5 minutes before the first class.
• Say hi to one kid in the morning.
• Sit next to 7th grade children in the morning meeting.
• Participate in a group project at school.
• Spend at least 10 minutes in the lunch room.
Biomarkers of CBT for anxiety in ASD

55% reduction in anxiety

- Reduced amygdala activation to faces vs. objects
- Increased activity in dorsolateral prefrontal cortex and anterior cingulate during emotion regulation

Disruptive behaviors in ASD

- Anger outbursts
- Tantrums
- Aggression
- Self-injury
- Noncompliance

Irritability
Impact of disruptive behavior

• Impairing in their own right
• Burden on family
• Interference with education
• Risk of injury
• Risk of property damage
• Derail development
Role of core ASD symptoms

- Rigidity (frustrated by minor changes in routines)
- Failure to recognize social context (cursing at school principal)
- Unusual triggers of frustration (rule violation)
- Communication (perseverating on topics of no interest to others)
- Deficits in social domain (frustration with social situations)
- Exaggerated nonverbal expressions (loud voice)
Primary treatment options for irritability

• Applied Behavior Analysis (ABA)

• Psychopharmacology

• Parent Management Training (PMT)
Irritability in adolescents with ASD

- Disruptive behavior is likely to persist in adolescence.
- Medication has side effects.
- Parent training and ABA programs don’t make use of the cognitive and communication skills of adolescents with higher-functioning ASD.
- Why not try CBT for typically developing children with disruptive behavior disorders?
CBT for irritability in typical development

Treatment format:

• 12 weekly sessions
• Dedicated parent component
• Optional school consultation

Treatment goals:

• To reduce frequency and intensity of anger outbursts and aggression
• To increase skills for managing frustration
• To improve social problem-solving
Education about anger episode

HANDOUT 1

Elements of an Anger Episode

Triggers → Feelings → Actions → Outcomes

Thoughts → Rules

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Identify triggers of anger

**Anger Triggers**

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Use calming thoughts

One child in our program reported that a kid in his music class was throwing paper clips at him when the teacher was not looking, and he made a list of thoughts that went through his mind:

- *I’m gonna punch him in the face*

- *Human nature is driving me crazy*

- *It’s not worth getting all worked up about*

- *He is an idiot; I don’t need to stoop to his level*
Parent training

Core principles:

• The ABC of behavior
• Differential attention
• Effective commands
• Praise and rewards
• Daily routines

Patterson, Reid, Dishion (1992)
Rewards

- Look for positive opposites
- “Catch them being good”
- Enjoyable interaction
- Child guided play
- Verbal praise
- Nonverbal praise
- Sticker charts
- Token economies
Behavior therapy for irritability in ASD

Subjects:
- 9 adolescents (1 girl, 8 boys),
- Age range 11 to 16 years old
- Full Scale IQ ranged from 80 to 112, mean 95
- Score ≥ 16 on irritability scale of Aberrant Behavior Checklist
- 2 unmedicated and 7 on stable medication

Treatment:
- 12-15 sessions of CBT for irritability

Outcomes:
- Parent-rated ABC irritability scale
- fMRI with frustration-induction GoNoGo task

Perlman & Pelphrey, 2010
Behavior therapy for irritability in ASD

65% reduction in ABC irritability score

Increase in prefrontal activity after CBT

RDoC study of CBT for aggression/irritability

• Subjects are randomly assigned to 12 sessions of CBT or 12 sessions of Supportive Psychotherapy (SPT).

• Children perform neurocognitive tasks of emotion regulation and face perception during fMRI scanning and EEG recording at baseline and endpoint.

• Primary clinical outcomes are the Modified Overt Aggression Scale and the CGI-Improvement scale administered by an independent evaluator.

Sukhodolsky, Vander Wyk, …Pelphrey, JCAP, 2016
Frustration-induction GoNoGo

3 conditions: Winning – Losing – Recovery

Adapted from Perlman & Pelphrey, 2010
Neural targets of behavior therapy for irritability

Reduced prefrontal activity in 50 children with aggressive behavior relative to 25 community controls without aggression.

There is a negative correlation \( r = -0.37 \) of aggression with the ventromedial prefrontal cortex activation in the emotion-regulation contrast of the frustration-induction GoNoGo task.
Ruby, a 15 year-old girl with ASD, participated in a randomized trial of CBT for irritability. She presented with daily anger outbursts that lasted up to 10-15 minutes and with longer, multiple-hour outbursts 1-2 times per month. Anger was often triggered when routines were impeded or when another person disagreed with an idea that she found highly important. Specific behaviors included standing in one spot, tensing all her muscles, crying, screaming, and making verbal threats.
Modification of behavioral interventions for ASD

- Treatment is focused on target problems
- Flexible implementation
- Includes functional assessment
- Enhanced parent component
- Separate module to address unique social/communication deficits and restricted interests
- School visit or telephone consultation
Summary

• Cognitive-behavioral therapy can be useful for anxiety in children with ASD.

• More work is needed to develop and test effective behavioral interventions for irritability in adolescents with ASD.

• Research Domain Criteria (RDoC) approach offers a valuable framework for studying common and unique characteristics of children with ASD relative to children with other forms of developmental psychopathology.

• Understanding the neural targets of CBT will enable improvement of existing treatments and the development of novel interventions for children with ASD.
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