Reduced Amygdala Volume and Elevated Anxiety in Children

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Kids with 22qDS and their families have a lot to cope with!

• Early major medical interventions and ongoing health and development issues
• Socioemotional impairments
• Cognitive impairments that complicate education
• Co-morbid for other Dx (ADHD, OCD)
• Problems become more prominent with increasing social and academic demands.
Stress and Chromosome 22q11.2DS

Stress and allostatic load in 22qDS likely results from a multivariate and reciprocal interaction of:

– Atypical brain development
– Early traumatic experiences
– Medical, behavioral, cognitive, and socioemotional challenges associated with the syndrome borne by the children and their families
– Genetically derived temperament, coping capacity, and resilience

Elevated anxiety in 22q11.2DS vs. TD kids
Elevated depression in 22q11.2DS vs. TD kids

Anxiety has measurable and important behavioral implications for kids with 22q11.2DS.
Separation anxiety does not abate in 22q

Neuroanatomical and genetic markers that may highlight high-risk subgroups in 22q11.2DS sample
Amygdala volume, anxiety, and stress.

- **Increased volume** related to length of time reared in orphanages \textsuperscript{(Tottenham et al. 2010)}
- **Left AMYG smaller** in pediatric anxiety patients vs. control \textsuperscript{(Milham et al., 2005)}
- **Left < Right AMYG** predictive of anxiety in kids with ASD \textsuperscript{(Juranek et al. 2006)}

**Smaller Left Amygdala Volume in 22q11.2DS vs. TD**

\begin{figure}
\centering
\includegraphics[width=\textwidth]{amygdala_volume_chart.png}
\caption{Mean \pm SE Amygdala Volume mm\textsuperscript{3} (controlling for GM and Age)}
\end{figure}

Beaton et al. (In Preparation)
Smaller Left vs. Right Amygdala Volume in 22q11.2DS but not TD

Beaton et al. (In preparation)

(Controlling for GM and Age)

Total MASC Anxiety Vs. Amygdala Volume

In 22q11.2DS subset, elevated anxiety predicts smaller right amygdala volume controlling for grey matter volume and age.
Summary

• As a group, children with 22q11.2DS report greater levels of anxiety and depression vs. TD

• Smaller amygdala in 22q11.2DS may serve as a developmental marker of risk for anxiety and stress vulnerability

• Physiological effects of anxiety and depression have deleterious effects over time and may contribute to elevated risk for adult psychopathology

• We can treat anxiety, mood, and teach coping/social skills = improved quality of life now with probable benefits in adulthood

Elliott Beaton is joining the Department of Psychology faculty at the University of New Orleans

We will be continuing our research on stress, development and health in children with 22q11.2DS at the MIND Institute and at the:

Stress, Cognition, and Affective Neuroscience (SCAN) Laboratory

http://psyc.uno.edu/
Thank you.

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