

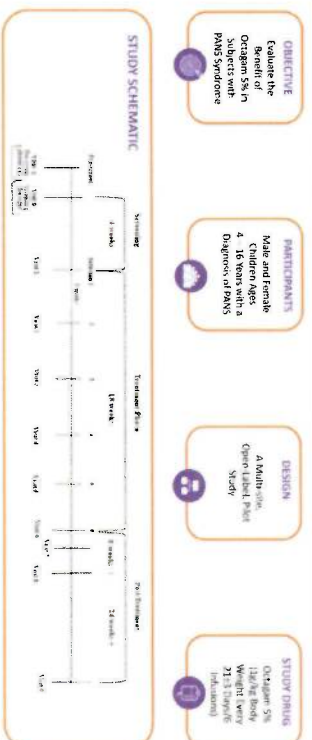
Pediatric Acute-Onset Neuropsychiatric Syndrome (PANS) as a Post-Infectious Autoimmune Disease: Benefits of Intravenous Immunoglobulin (IVIg)

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Introduction

- In the late 1990s, a subgroup of children who presented with obsessive compulsive disorder (OCD) and/or tic disorders following streptococcal infections were described as having Pediatric Acute-Onset Neuropsychiatric Syndrome (PANS).
- Psychiatric disorders associated with streptococcal infections (PANDAS) was developed to describe the infection?
- Due to difficulties in determining a relationship between strep infections and PANDAS symptoms, a new diagnosis, pediatric acute onset neuropsychiatric syndrome (PANS), was developed to encompass the growing number of infectious agents potentially related to PANS onset.
- Significant findings indicate a relationship between a post-infectious response and behavioral changes^{1,2}; this suggests a form of post-infection autoimmunity through molecular mimicry.
- Previous studies^{3,4} have hypothesized that an immune directed to the underlying microbe (leading to PANS). Based on this hypothesis, we proposed a study to explore the efficacy of IVIG [Octagam 5%] for PANS treatment.

Study Overview/Schematic



Results (continued)

- Changes in Psychological Evaluation Scores from Baseline to Visit 7/8/9**
 - Parent-Rated Symptom Survey
 - Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS)
 - Yale Global Tic Severity Scale (NGTSS)
 - Amey's Disorder Interview Schedule for DSM-IV (ADIS)
 - Clinical Global Impression (CGI)
 - Responder Review Neuropsychiatric Symptom Scale-Phone
 - Parent and Patient Adjective (various)

Results

- Total of 21 participants at 3 clinical sites.
- Mean age: 10.86 yrs, males (11 [62.2%]), females (8 [38.8%]).
- Mean follow-up time from Visit 0 to Visit 8 was 186 days (~133 days).
- Line follow-up (Visit 9) occurred 29-46+ weeks after last IVIG infusion to gather data on durability of response.

Results (continued)

- The primary efficacy endpoints were determined by clinical observation, parent observation, validated psychometric assessments, and interviews by psychopathologists/psychiatrists.
- Statistically significant improvements were demonstrated in all psychometric assessments from baseline to assessment 186-212.
- Results from the CGI-Severity assessment (Figure 3) demonstrated significant reductions in obsessive thoughts and behaviors (Visit 7/8/9 as compared to treatment beginning at infusion 3 through infusion 6 compared to baseline).
- Results from the Parent-Rated Symptom Survey (Figure 2) demonstrated significant reductions in symptoms.
- Results from the CGI-Severity of Illness Scale (Figure 3) demonstrated significant reductions from baseline as compared to results at Visit 7/8/9, as well as reductions in the follow-up period (Visit 7 to Visit 8; Visit 8 to Visit 9).
- Cumulative mean (Moderate/Severe) (Figure 4 [left]) 100% of subjects demonstrated out-of-range results.
- Neural Zoomer (Vibrant Wellness) (Figure 4 [right]) 71.4% of subjects demonstrated out-of-range results.

Figure 2. Parent-Rated Symptom Survey Results

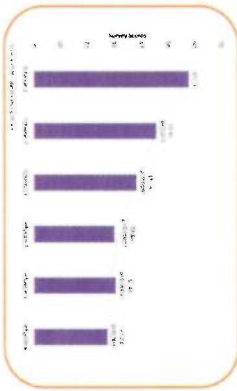


Figure 3. CGI Severity of Illness Scale Results

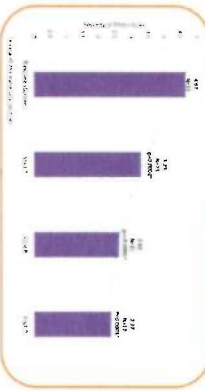
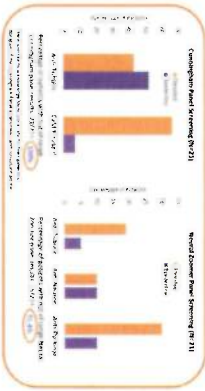


Figure 4. Brain Autoimmunity Results



Conclusions

- In PANS patients, all psychometric endpoints studied exhibited statistically significant decrease following 6 cycles (infusions) of IVIG as well as durability of response for up to 46 weeks in a subset of subjects.
- Patients with PANS can benefit from a 6-cycle course of IVIG.
- Provisional data demonstrate durability of the positive impact of IVIG treatment.
- PANS is an autoimmune disease; innate immunity and the complement system may play a role in the pathogenesis of PANS.

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