

# Impact of Severe Rare Childhood Epilepsy on Siblings: Interim Findings from the Sibling Voices Survey

Laurie D. Bailey<sup>1</sup>; Arnold R. Gammitoni<sup>1</sup>; Bradley S. Galer<sup>1</sup>; Lauren Schwartz<sup>2</sup>; Carla Schadt<sup>1</sup>

<sup>1</sup>Medical and Scientific Affairs, Zogenix, Inc., Emeryville, CA, USA;

<sup>2</sup>Department of Rehabilitation Medicine, University of Washington, Seattle, WA, USA

## INTRODUCTION

- Severe epileptic encephalopathies (EEs) of childhood, such as Dravet syndrome (DS) and Lennox-Gastaut syndrome (LGS), are refractory to conventional anticonvulsants and result in developmental delays, neurocognitive impairment, and motor deficiencies<sup>1</sup>
- Comprehensive care of these patients results in substantial humanistic and economic burden<sup>2</sup>
- In a recent survey, 74% (114/154) of caregivers reported concerns about the emotional impact on siblings of a brother/sister with an EE<sup>3</sup>; the emotional impact experienced by immediate caregivers may affect the quality of life of the entire family, especially siblings<sup>4</sup>
- Siblings often play a role in caring for EE patients, and the impact on sibling mental health and social development may be under-recognized by the medical community
- The Sibling Voices Survey is focused on aspects that may impact sibling mental well-being
  - Survey questions are designed to assess risk of depression and anxiety and other aspects that impact sibling mental health

## METHODS

### Survey Development and Recruitment

- Online survey questions were developed in consultation with DS and LGS patient communities and healthcare professionals (www.siblingsurvey.com)
- Questions were refined via beta testing in small groups of parents and siblings
- Age- and role-specific surveys were developed for 4 cohorts: siblings 9-12 years, 13-17 years, and ≥18 years and parents (not reported here)
- The survey was launched on July 19, 2017; enrollment closed on December 31, 2017
- Potential participants were recruited through patient advocacy websites, social media, medical meetings, and patient community events
- The study protocol was approved by Western IRB (Puyallup, WA) on July 14, 2017

### Survey Design

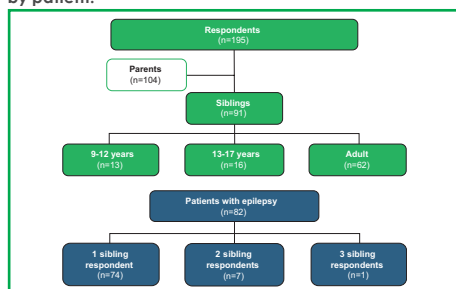
- This interim analysis focused on risk factors for depression and anxiety
- Four questions assessed the potential for depressed mood
  - Composite scores were calculated by assigning numerical values to the survey responses of "not at all" (0), "a little" (1), "sometimes" (2), or "a lot" (3), then summing the responses of these 4 questions; total (composite) scores ≥8 were considered indicators of mood symptoms for each cohort
  - An additional question assessed sadness about their sibling's diagnosis (composite scores ≥6 were considered indicators of depressed mood for each cohort)
- Two questions assessed the potential for anxiety
  - Composite scores were calculated by assigning numerical values to the survey responses as described above, then summing the responses of these 2 questions; total scores ≥4 were considered indicators of anxiety symptoms for each cohort
  - An additional question assessed stress over their sibling's diagnosis (composite scores ≥6 were considered indicators of anxiety symptoms for each cohort)
- Free-form responses were evaluated by indicators of depressed mood and anxiety symptoms

## RESULTS

### Sibling Voices Survey Respondents

- Responses received from July 19 to August 31, 2017 were analyzed
- Most of the respondents were adults (Figure 1)
- The 91 sibling respondents represented 82 families of patients with epilepsy; between 1 and 3 siblings responded per family (Figure 1)

Figure 1. Sibling Voices Survey respondents, overall and by patient.



### Respondent Demographics

- Demographic characteristics of sibling respondents and EE patients are presented in Table 1 (sibling characteristics) and Table 2 (patient characteristics)

Table 1. Demographic Characteristics of Sibling Survey Respondents (n=91)

Characteristic	Age Group			All
	9-12	13-17	Adult	
N	13	16	62	91
Sex, n (%)				
Male	6 (46)	11 (69)	14 (23)	31 (34)
Female	7 (54)	5 (31)	48 (77)	60 (66)
Twin sibling, n (%)	1 (8)	0 (0)	1 (2)	2 (2)
Age, years, mean±SD (range)	10±1 (9-12)	14±1 (13-15)	27±8 (18-63)	22±10 (9-63)
School grade, mean±SD (range)	5±1 (3-7)	9±1 (8-11)	NA	NA
Family size, mean±SD (range)	5±1 (4-8)	6±2 (4-10)	5±4 (1-30)	5±3 (1-30)
No. of children/family, mean±SD (range)	3±1 (2-6)	4±2 (2-8)	3±2 (0-10)	3±2 (0-10)

SD, standard deviation; NA, not applicable.

Table 2. Demographic Characteristics of EE Patients (n=82)

Characteristic	
N	82
Patient sex, n (%)	
Male	33 (40)
Female	49 (60)
Patient age, years, mean±SD (range)	19±11 (1-61)
Epilepsy diagnosis, n (%)	
Dravet syndrome	29 (35)
Lennox-Gastaut syndrome	11 (13)
Other epileptic encephalopathy	42 (51)

SD, standard deviation.

### Mood Symptoms

- Sibling responses to questions assessing the potential for depressed mood are shown in Figure 2 (individual questions) and Figure 3 (composite scores)
- The 13-17 age group scored lowest of all cohorts on the 4 indicators of potential mood symptoms (Figure 2)
- Composite scores for mood symptoms were approximately 2-fold higher in the other age groups (Figure 3A)
- In adult siblings, 37% reported a history of treatment for clinical depression

Figure 2. Responses to questions assessing the potential for mood symptoms.

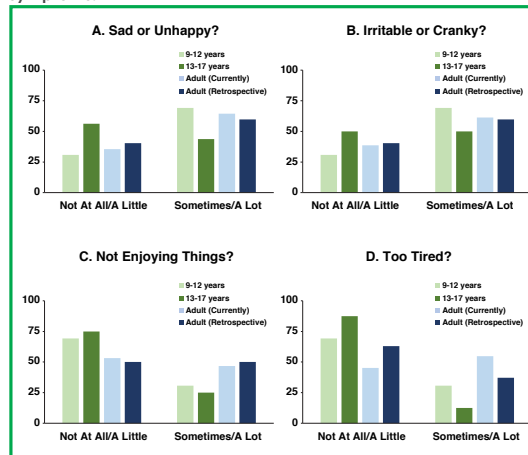
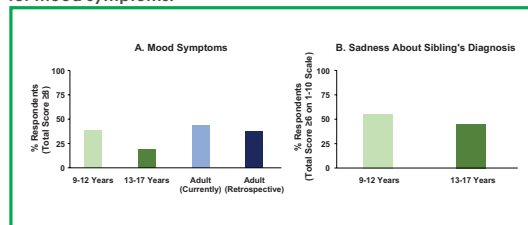


Figure 3. Composite scores for questions assessing the potential for mood symptoms.



- Free-form responses suggestive of mood symptoms are shown in Table 3

Table 3. Free-Form Responses Suggestive of Mood Symptoms

Age Group	Response
13-17	"When I think about it sometimes I start to cry and it makes me upset."
	"I feel guilty because I am the older sibling for him and a role model but I don't think I'm doing a good job."
Adults	"...makes me feel guilty and also angry that I have to feel like this."
	"I feel like I feed off my mum's mood a lot so if she was negative or stressed because of my brother's Dravet, my concern for this this would affect me – often caused arguments or lowered my mood."

### Anxiety Symptoms

- Sibling responses to questions assessing the potential for anxiety are shown in Figure 4 (individual questions) and Figure 5 (composite scores)
- Feeling jumpy or easily startled was more frequently reported "sometimes" or "a lot" in the 9-12 age group than the 13-17 age group or in adult siblings (Figure 4B)
- The 13-17 age group scored lowest of all cohorts on the 2 composite indicators of anxiety (Figure 5)

Figure 4. Responses to questions assessing the potential for anxiety.

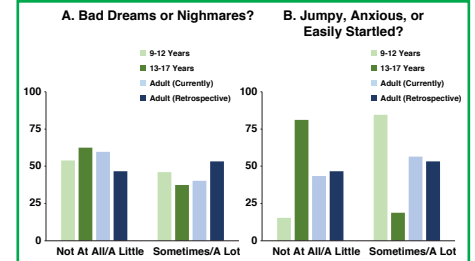
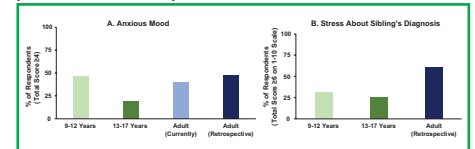


Figure 5. Composite scores for questions assessing the potential for anxiety.



- Free-form responses suggestive of anxiety are shown in Table 4

Table 4. Free-Form Responses Suggestive of Anxiety

Age Group	Response
13-17	"I try spend some time reading or listening to music to calm me down."
	"I love doing sports to get my mind away from all the drama at home."
Adults	"It scared me and caused me a lot of stress that I did not believe I should share with others. I kept it to myself and it made me shut people out."
	"Their stress and frustration are contagious and it sits like a dark cloud above our heads."

## CONCLUSIONS

- This interim analysis of the Sibling Voices Survey suggests that siblings of children with DS, LGS, and other EEs may be at risk for depression and anxiety
- A substantial portion of respondents reported sadness and stress over their sibling's epilepsy, including responses suggestive of depressed mood and anxiety
- In adult siblings, 37% reported receiving treatment for clinical depression
- This study confirms and extends previously reported findings suggesting that caring for a child with DS, LGS, or other severe EEs adversely affects the entire family unit<sup>4,5</sup>

### Future Directions

- Siblings of children with EE may represent an "at risk" population who warrant assessment, monitoring, and potential intervention for depression and anxiety
- Clinicians should discuss the potential for sibling depressed mood and anxiety with parents
- Further research is warranted to better understand how to identify those siblings exhibiting signs suggesting depression and/or anxiety and the best methods for intervention

## REFERENCES

- Wallace A, et al. *Paediatr Drugs*. 2016;18(3):197-208.
- Jensen MP, et al. *Epilepsy Behav*. 2017;70(Pt A):104-9.
- Villas N, et al. *Epilepsy Behav*. 2017;74:81-6.
- Jensen MP, et al. *Epilepsy Behav*. 2017;74:135-43.

## DISCLOSURE

LDB, ARG, BSG, CS: Employee, Zogenix; Stock ownership, Zogenix. LS: Consultant, Zogenix.

## ACKNOWLEDGEMENTS

The Sibling Voices Survey was developed and is supported by Zogenix, Inc. (Emeryville, CA). Medical writing and editorial assistance for this poster was provided by Edward Waselcouch, PhD, Danielle Ippolito, PhD, and Donald Fallon, ELS, of PharmaWrite, LLC (Princeton, NJ) and was funded by Zogenix, Inc.