An Online Survey of Caregivers for Patients with SCN8A Developmental and Epileptic Encephalopathy (SCN8A-DEE) or SCN8A-Related Epilepsy

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INTRODUCTION

- SCN8A developmental and epileptic encephalopathy (SCN8A-DEE) is a rare and serious genetic epilepsy syndrome characterized by early-onset developmental delay, cognitive impairment, and intractable seizures[1]
- Variants in the SCN8A gene are associated with a broad phenotypic spectrum and varying degrees of disease severity[2]
- The Cute Syndrome Foundation (TCSF) is an advocacy group that raises awareness of SCN8A-related epilepsies and provides support for families of children with this disorder
- A caregiver survey solicited by TCSF was conducted to better understand the variability in the clinical presentation of SCN8A-DEE and SCN8A-related epilepsy

METHODS

- A 36-question online survey was developed to obtain de-identified data from caregivers of children with SCN8A-DEE or SCN8A-related epilepsy located in the USA, Canada, UK, and Australia
- Families were recruited by targeted email outreach, a social media campaign, and an educational webinar
- Survey responses regarding patient demographics, comorbidities, seizure severity and type, current and prior anti-seizure medication (ASM) use, and best/worst ASMs per caregiver perception were collected over 3 weeks in late 2019
- Results were based on available responses and analyzed descriptively

RESULTS

- Based on 116 qualified survey responses (87 USA, 12 Canada, 12 UK, 5 Australia), 66% of patients were 2 to <12 years of age and the mean age at seizure onset was 9 months (**Table 1**)
- Seizure frequency tended to decrease from time of onset to time of survey ("current" status) (**Table 1**)
  - At onset, 14% (15/104) of patients had >10 seizures per day; currently, 10% (11/108) were experiencing >10 seizures per day

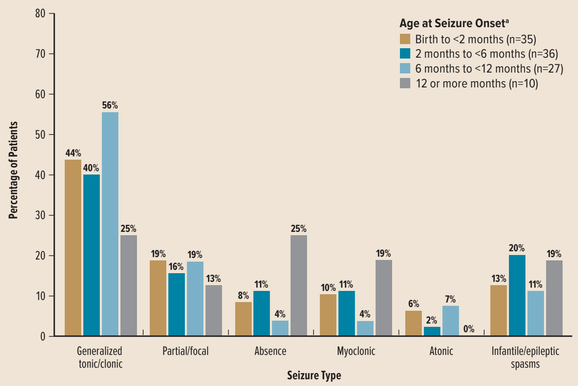
Table 1. Patient Characteristics by Current Age

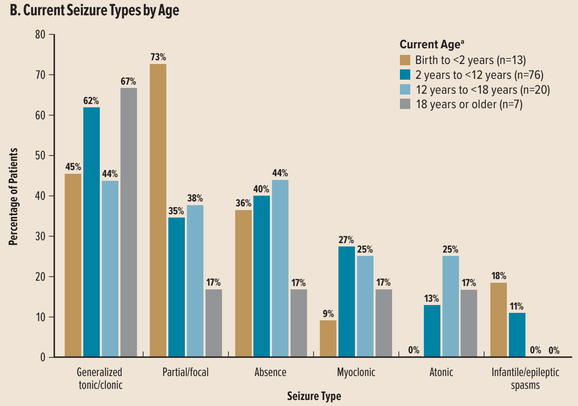
	0 to <2 Years (n=13)	2 to <12 Years (n=76)	12 to <18 Years (n=20)	18 Years or Older (n=7)	Overall Study Population (N=116)
Age at seizure onset					
Mean (SD), years	0.18 (0.15)	0.54 (1.10)	1.23 (2.73)	2.75 (5.07)	0.75 (1.91)
Median (min, max), years	0.17 (0.01-0.58)	0.33 (0-8)	0.38 (0.08-12)	0.58 (0-13)	0.33 (0-13)
Seizure frequency at onset, n (%)[a]					
>10 per day	1 (8)	9 (14)	5 (25)	0 (0)	15 (14)
2-10 per day	6 (46)	19 (29)	6 (30)	1 (20)	32 (31)
1 per day	1 (8)	10 (15)	3 (15)	0 (0)	14 (13)
1 per week	4 (31)	18 (27)	3 (15)	2 (40)	27 (26)
1 per month	1 (8)	5 (8)	1 (5)	1 (20)	8 (8)
<1 per month	0 (0)	5 (8)	2 (10)	1 (20)	8 (8)
Current seizure frequency, n (%)[b]					
>10 per day	3 (23)	6 (9)	2 (10)	0 (0)	11 (10)
2-10 per day	2 (15)	5 (7)	4 (20)	2 (33)	13 (12)
1 per day	1 (8)	10 (14)	0 (0)	1 (17)	12 (11)
1 per week	1 (8)	8 (12)	2 (10)	2 (33)	13 (12)
1 per month	1 (8)	7 (10)	2 (10)	1 (17)	11 (10)
<1 per month	2 (15)	12 (17)	6 (30)	0 (0)	20 (19)
Seizure-free	2 (15)	19 (28)	4 (20)	0 (0)	25 (23)
Unknown but not seizure-free	1 (8)	2 (3)	0 (0)	0 (0)	3 (3)

[a]Based on available data: frequency at onset (2 to <12 years n=66; 18 years or older n=5; overall n=104).
[b]Based on available data: current frequency (2 to <12 years n=69; 18 years or older n=6; overall n=108).

- The most common seizure type was generalized tonic/clonic, both at seizure onset and for current seizures (40% and 57% of all patients, respectively)
  - Absence seizures were also common at seizure onset (40% of all patients), reported in 25% of patients aged 12 months or older (**Figure 1A**)
  - Current partial/focal seizures were also common (39% of all patients), reported in 73% of patients aged 0 to <2 years (**Figure 1B**)

Figure 1. Seizure Types





[a]n-values represent the total number of patients per age group, but percentages are based on available data. For seizure type at onset, responses were not available for 8 patients. For current seizure type, responses were not available for 28 patients. Caregivers could report >1 type of seizure per patient if needed.

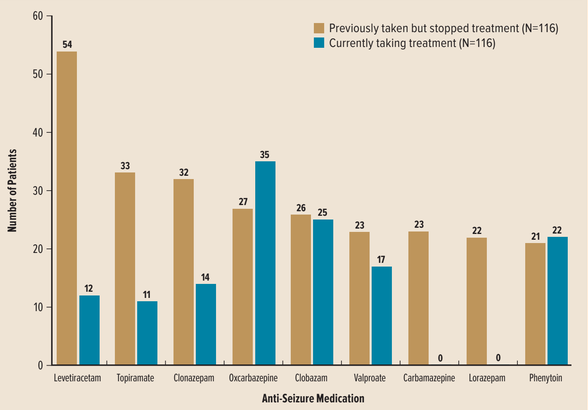
- The most common comorbid conditions in patients with SCN8A-DEE or SCN8A-related epilepsy were intellectual disability, hypotonia, and movement disorder (**Table 2**)

Table 2. Comorbid Conditions

Conditions, n (%)	0 to <2 Years (n=13)	2 to <12 Years (n=76)	12 to <18 Years (n=20)	18 Years or Older (n=7)	Overall Study Population (N=116)
Intellectual disability	6 (46)	56 (74)	19 (95)	5 (71)	86 (74)
Hypotonia	8 (62)	44 (58)	11 (55)	3 (43)	66 (57)
Movement disorder	5 (38)	36 (47)	9 (45)	0 (0)	50 (43)
Difficulty swallowing	7 (54)	26 (34)	9 (45)	2 (29)	44 (38)
Gastric tube for feeding and medicines	6 (46)	25 (33)	9 (45)	2 (29)	42 (36)
Autism	0 (0)	25 (33)	7 (35)	1 (14)	33 (28)
Visual impairment	4 (31)	20 (26)	4 (20)	0 (0)	28 (24)
Variants in additional genes	0 (0)	19 (25)	2 (10)	1 (14)	22 (19)
Continuous spikes and waves during slow-wave sleep syndrome	2 (15)	13 (17)	3 (15)	0 (0)	18 (16)
Infantile spasms	5 (38)	8 (11)	1 (5)	0 (0)	14 (12)
Requires oxygen/ventilation support	2 (15)	6 (8)	2 (10)	2 (29)	12 (10)
Electrical status epilepticus during slow sleep	1 (8)	7 (9)	0 (0)	0 (0)	8 (7)

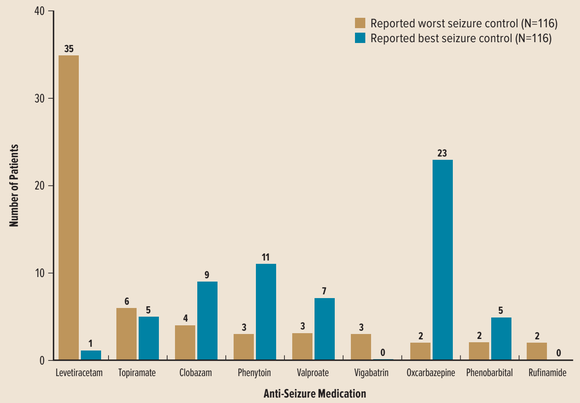
- 88% of all patients were currently taking ≥1 ASM and 80% had previously taken but stopped ≥1 ASM
- Levetiracetam was the prior ASM most commonly stopped, and oxcarbazepine was the current ASM most commonly used (**Figure 2**)

Figure 2. Stopped and Current Anti-Seizure Medications



- Levetiracetam was most commonly reported by caregivers as past treatment having the "worst" seizure control, and oxcarbazepine was most commonly reported as having the "best" seizure control (**Figure 3**)

Figure 3. Worst and Best Anti-Seizure Medications per Caregiver Perception



CONCLUSIONS

- Patients with SCN8A-DEE or SCN8A-related epilepsy had high seizure burden, multiple neurologic and motor comorbidities, and inadequate treatment
- The high proportion of patients who previously tried and stopped various medications indicated general dissatisfaction with current treatment options, suggesting ongoing unmet therapeutic needs in this heterogeneous patient population

REFERENCES

1. Meisler MH, Helman G, Hammer MF, et al. *Epilepsia* 2016;57:1027-35.
2. Gardella E and Møller RS. *Epilepsia* 2019;60(Suppl):S77-85.

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Please email medinfo@neurocrine.com if you have any questions on this presentation.

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