Caregiver-Reported Seizure Outcomes With Real-World Use of Cannabidiol in Tuberous Sclerosis Complex: Interim Results From the BECOME-TSC Survey

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Background

- Tuberous sclerosis complex (TSC) is a neurocutaneous disorder, characterized by the formation of hamartomas in multiple organs, including the brain, skin, heart, eyes, kidneys, lungs, and liver.[1,2]
- Epilepsy is the most prevalent neurologic manifestation of TSC, with seizures that often start during infancy and may persist lifelong with multiple seizure types.[3]
- Treatment-resistant seizures associated with TSC are a significant and frequent cause of morbidity in people with TSC.[2,4]
- The plant-derived, highly purified pharmaceutical formulation of cannabidiol (CBD) is approved in the United States (US) for the treatment of seizures associated with Lennox-Gastaut syndrome, Dravet syndrome, and TSC in patients aged ≥1 year.[5]
- BECOME-TSC (**BE**havior, **CO**gnition, and **M**ore with **E**pidiolex® in TSC) is an ongoing cross-sectional survey to quantify the real-world impact of CBD on seizure and nonseizure outcomes in people with TSC.
  - This poster presents the seizure outcomes (nonseizure outcomes will be presented separately).

Objective

- To present caregiver-reported seizure outcomes following initiation of CBD treatment in people with TSC.

Methods

- Using electronic health records, healthcare professionals at TSC centers in the US identified people with TSC who were treated with CBD (Epidiolex®, 100 mg/mL oral solution) for ≥6 months.
- Caregivers of these individuals completed an online survey, consisting of multiple choice and rank order questions, based on the TSC-Associated Neuropsychiatric Disorders questionnaire,[6] other validated measures, and previous caregiver reports.
- Respondents compared the past month to the period before CBD initiation and rated their impression of change using a symmetrical 3-, 5-, or 7-point Likert scale (from worsening to improvement) depending on the domain.
- 'Don't Recall' or 'Not Applicable' responses were excluded.
- Continuous variables were summarized as means, medians, and ranges, and categorical variables as frequency distributions and percentages.
- CBD-associated adverse events, which can include transaminase elevations, somnolence, decreased appetite, diarrhea, pyrexia, vomiting, fatigue, rash, sleep disorders, and infections, were not assessed.
- The survey was conducted with caregivers of people taking Epidiolex®, and the results do not apply to other CBD-containing products.

Results

- At the time of analysis, 12 caregivers had completed the survey.

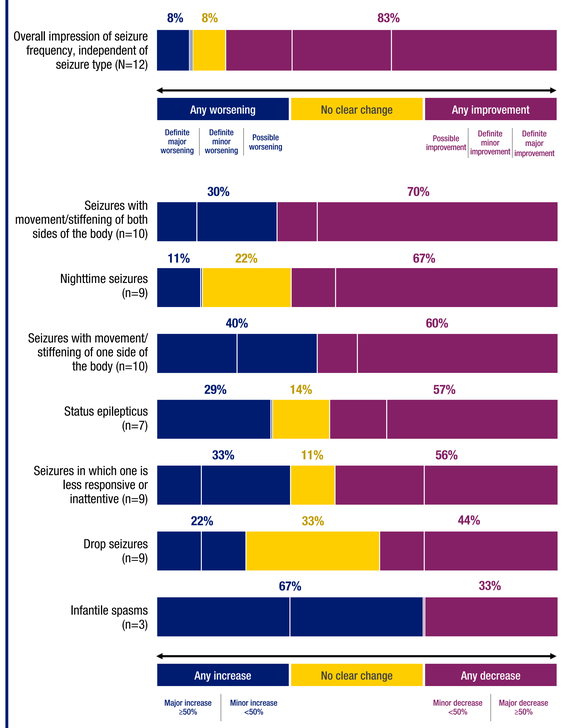
Table 1. Characteristics of patients in the survey

	Patients (N=12)
Mean age, years (SD)	16.2 (8.4)
Number of ASMs before CBD initiation, median (Q1, Q3)	4 (2, 5)
Mean age at seizure onset, months (SD)	17.2 (32.9)
Most common concomitant (≥30%) ASMs, n (%)	
Everolimus	5 (42)
Clonazepam	4 (33)
Seizure types (in >10% of patients) at CBD initiation, n (%)	
Focal onset with impaired awareness	6 (50)
Focal to bilateral tonic-clonic	6 (50)
Clonic	2 (17)
Absence	2 (17)
Median CBD dose at the time of survey, mg/kg/d (Q1, Q3)	17 (15, 23)

ASM, antiseizure medication; CBD, cannabidiol; Q1, first quartile; Q3, third quartile.

- Fifty percent of patients in the survey had a history of infantile spasms.
- At the time of CBD initiation, focal to bilateral tonic-clonic (42%) and focal onset with impaired awareness (33%) were reported as the most severe and most frequent seizure types.

Figure 1. Seizure frequency

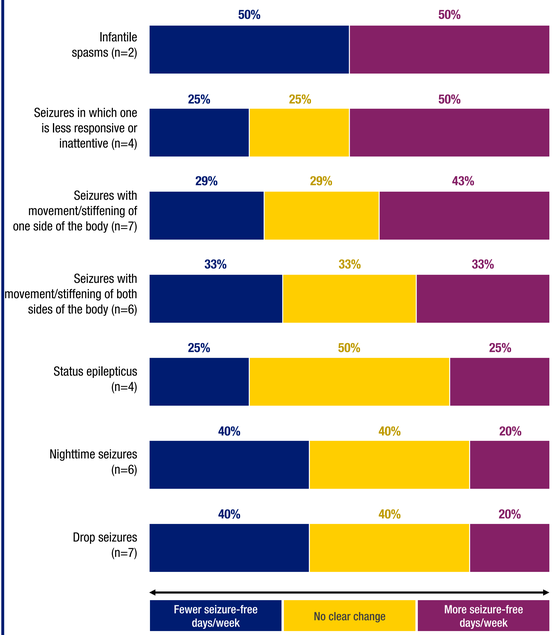


- More than 50% of respondents reported improvements in the frequency of seizures that involve movement or stiffening of both or one side of the body, nighttime seizures, status epilepticus, and seizures where one is less responsive/inattentive.

Figure 2. Seizure severity

- Most respondents reported decrease in rescue medication use (80%) and occurrence of seizure-related injuries (75%).

Figure 3. Seizure-free days



- Seizure freedom in the past month was reported by 5 of 12 caregivers (42%).

Plans for continuing CBD treatment

- Compared to the time before initiation of CBD treatment, 75% of all caregivers reported any improvement in the overall condition of patients.
- Of the 12 respondents in the survey, 11 planned to continue CBD treatment.
- Of caregivers who planned to continue CBD treatment, reduced seizure frequency and severity were given as the most important reason for continuing by 82% of respondents each; improved cognition (64%), language/communication (55%), and alertness (55%) were other reasons for continuing CBD treatment.

Conclusions

- In this preliminary analysis of BECOME-TSC, an ongoing cross-sectional survey of caregivers of people with TSC who are taking CBD treatment:
  - Most caregivers reported improvements in seizure frequency (83%) and severity (92%).
  - Complete seizure freedom in the past month was reported by 42% of respondents.
  - Improvements were most commonly reported in the frequency of seizures that involve movement or stiffening of both or one side of the body, nighttime seizures, status epilepticus, and seizures where one is less responsive/inattentive.
  - The majority of respondents planned to continue CBD treatment primarily because of reduced seizure severity/duration but also because of improvements in nonseizure outcomes, including cognition, emotional function, and language/ communication.
  - Limitations of the study include small sample size, use of retrospective caregiver accounts, and selection bias because of the study design. Adverse effects were not assessed and the effect of concomitant antiseizure medications was not considered in this analysis.

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