Suicide in Epilepsy: Identifying risks and steps to prevention

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Disclosure

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Learning Objectives

• Recognize the type of psychiatric comorbidity associated with suicidality
• Become familiar with the screening instruments that can be used to identify patients at risks for suicide.
• Learn how to use these screening instruments in an outpatient epilepsy clinic.
Magnitude of the problem…
Table 1
Rates of suicide

<table>
<thead>
<tr>
<th>Reference</th>
<th>Deaths</th>
<th>Suicides</th>
<th>Deaths by suicide (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladin [21]</td>
<td>3</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>Bridge [22]</td>
<td>45</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>Cockerell et al. [23]</td>
<td>150</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Currie et al. [24]</td>
<td>54</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Dalby [25]</td>
<td>10</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Freytag and Lindenberg [26]</td>
<td>294</td>
<td>9</td>
<td>3.1</td>
</tr>
<tr>
<td>Fukuchi et al. [27]</td>
<td>43</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Hauser et al. [28]</td>
<td>185</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Henriksen et al. [29]</td>
<td>104</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Iivanainen and Lehtimén [30]</td>
<td>179</td>
<td>13</td>
<td>7.3</td>
</tr>
<tr>
<td>Krohn [31]</td>
<td>107</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>Lennox and Lennox [32]</td>
<td>118</td>
<td>11</td>
<td>9.3</td>
</tr>
<tr>
<td>Lindsay et al. [33]</td>
<td>9</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Penning et al. [34]</td>
<td>171</td>
<td>4</td>
<td>2.3</td>
</tr>
<tr>
<td>Prudhomme [35]</td>
<td>1100</td>
<td>8</td>
<td>0.7</td>
</tr>
<tr>
<td>Rafnsson et al. [36]</td>
<td>224</td>
<td>4</td>
<td>1.7</td>
</tr>
<tr>
<td>Sillanpää [37]</td>
<td>18</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>Stepien et al. [38]</td>
<td>3</td>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>Taylor and Marsh [39]</td>
<td>37</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>White et al. [40]</td>
<td>636</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>Zielinski [41]</td>
<td>218</td>
<td>16</td>
<td>7.3</td>
</tr>
<tr>
<td>Average based on above studies</td>
<td></td>
<td></td>
<td>11.5</td>
</tr>
<tr>
<td>General population rate</td>
<td></td>
<td></td>
<td>1.1–1.2</td>
</tr>
</tbody>
</table>

*Adapted, with permission, from Robertson [6].

Jones et al., Epilepsy & Behavior, 2003
Suicide and Epilepsy

- Risk for completed suicide:
  - overall standardized mortality ratio (SMR) ranging from 3.5 to 5.0

Nilsson et al., *Epilepsia* 1997
Rafnsson et al., *Neuroepidemiology*, 2001
Risk Factors…
Risks of suicide: General population

- Mood disorder (bipolar depression > unipolar depression)
- Previous suicide attempts
- Other comorbid psychiatric disorders associated with impulsivity:
  - ADHD
  - Personality disorder
  - Alcohol and drug abuse.

Goodwin FK et al., *JAMA*, 2003
Psychiatric Disorders as Risk Factors of Suicide in epilepsy

<table>
<thead>
<tr>
<th></th>
<th>Rate Ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Epilepsy</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Epilepsy</td>
<td>2.4 (2.0-2.8)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Epilepsy + Affective Disorder</td>
<td>32.0 (20.8-49.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>11.4 (4.16-31.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>12.5 (8.05-22.7)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Do AEDs increase suicidal risk?

- Validity of FDA data of increased suicidal risks questioned
- FDA data has yet to be replicated.

- Certain AEDs can cause depression and anxiety disorder
  - Barbiturates
  - Vigabatrin
  - Topiramate
  - Zonisamide
  - Levetiracetam

In individuals at risk of psychiatric illness

Brent et al., Pediatrics 1987
Mula et al., Epilepsia 2003
Mula & Sander, Epilepsia 2007
Trimble et al., Seizure 2000
Screening for suicidality and psychiatric disorders associated with suicidal risk
# Neurological Disorders Depression Inventory in Epilepsy (NDDI-E)

For the statements below, please circle the number that best describes you over the last two weeks including today.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Always or Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everything is a struggle</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Frustrated</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Nothing I do is right</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Feel guilty</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Difficulty finding pleasure</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I’d be better off dead</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Gilliam et al., *Lancet Neurology*, 2006
## Patient Health Questionnaire-Generalized Anxiety Disorder-7 (GAD-7)

For the statements below, please circle the number that best describes you over the last two weeks including today.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Nearly every day</th>
<th>More than half the days</th>
<th>Several days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling nervous, anxious or on edge</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Not being able to stop or control worrying</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Worrying too much about different things</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Trouble relaxing</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Being so restless that it is hard to sit still</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Being easily annoyed or irritable</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Feeling afraid as if something awful might happen</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Suicidality Module M.I.N.I.

1. Did you ever make a suicide attempt?  YES  NO

In the past month did you:

2. Think you would be better off dead or wish you were dead?  YES  NO
3. Want to harm yourself?  YES  NO
4. Think about suicide?  YES  NO
5. Have a suicide plan?  YES  NO
6. Attempt suicide?  YES  NO

YES in 1, or 2, or 3 = LOW RISK
YES in 4 or 1 + 3 = MODERATE RISK
YES in 5 or 6 or 1+4 = HIGH RISK

Sheehan et al, J Clin Psychiatry 1998
Beck Depression Inventory-II Suicidal Ideation: Item 9

0. I don’t have any thoughts of killing myself
1. I have thoughts of killing myself, but I would not carry them out.
2. I would like to kill myself
3. I would kill myself if I had the chance.

If options 2 or 3 chosen, ask:

“What has kept you from hurting yourself?”

Beck et al., Clin Psychol Rev, 1988
Examples...
Quick screen of suicidal risk: Item 9 from BDI-II

\[ N = 188 \]

0. I don’t have any thoughts of killing myself: 
\[ n = 164 (87.3\%) \]

1. I have thoughts of killing myself, but I would not carry them out: 
\[ n = 22 (7.2\%) \]

2. I would like to kill myself: 
\[ n = 1 (0.5\%) \]

3. I would kill myself if I had the chance: 
\[ n = 1 (0.5\%) \]
Screening for Depression and Generalized Anxiety Disorder at the Rush Epilepsy Center

N = 655 consecutive English-speaking adults.
Age: $\geq 18$ year-old
Gender: 54.5% women

- NDDI-E $> 15$: 17.9%
- GAD-7 $> 10$: 20.4%
- Both: 10.9%

Kanner et al, Epilepsia 2009; Poster 2.152. Submitted.
Correlation between total NDDI-E and GAD-7 scores

Kanner et al, Epilepsia, 2009 Poster 2.152; submitted
Suicidality Module M.I.N.I*.

n = 655

1. Did you ever make a suicide attempt?  YES  NO  7.3%

In the past month did you:

2. Think you would be better off dead or wish you were dead?  YES  NO  6.2%
3. Want to harm yourself?  YES  NO  3.0%
4. Think about suicide?  YES  NO  5.4%
5. Have a suicide plan?  YES  NO  1.5%
6. Attempt suicide?  YES  NO  0.5%

Kanner et al, Epilepsia 2009. Poster 2.152; submitted
Suicidality Module M.I.N.
Positive Answer in the absence of MDE
n = 655

*In the past month did you:*

2. Think you would be better off dead or wish you were dead? YES 2.1%
3. Want to harm yourself? YES 1.7%
4. Think about suicide? YES 2.0%
5. Have a suicide plan? YES 0.3%
6. Attempt suicide? YES 0%

Kanner et al, Epilepsia 2009. Poster 2.152; submitted
Suicidal Risk based on MINI in an outpatient population of patients with epilepsy

- Low risk: 9.2%
- Moderate risk: 3.6%
- High risk: 2.4%

Kanner et al, Epilepsia 2009; Poster 2.152. Submitted.
Association between severity of suicidal risk and the presence of suspected diagnosis of MDE, GAD and MDE+GAD

**Association* between suicidal risk and:**

NDDI-E > 15:
- $x^2 = 75.6$, df = 3, $p<0.0001$

GAD-7 > 10
- $X^2 = 77$, df = 3, $p<0.0001$

NDDI-E > 15 + GAD-7 > 10
- $X^2 = 69.3$, df = 3, $p<0.0001$

*Kruskal Wallis Test

Kanner et al, Epilepsia 2009; Poster 2.152. Submitted.
Does Screening for Depression, Anxiety and Suicidality have an impact on these conditions?

- $N = 116$
- All patients completed NDDI-E, GAD-7 and MINI-Suicidality module in 2 subsequent visits.
- Referred for psychiatric treatment patients with:
  - NDDI-E $> 15$
  - GAD-7 $> 10$
  - Any positive answer in questions 2 to 6 of the MINI-S.

Kanner et al., 2012; Submitted
### Positive answers

**In the past month did you:**

<table>
<thead>
<tr>
<th>Question #</th>
<th>Visit 1</th>
<th>Visit 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Think you would be better off dead or wish you were dead?</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>3. Want to harm yourself?</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>4. Think about suicide?</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>5. Have a suicide plan?</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6. Attempt suicide?</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

*Kanner et al., 2012; Submitted*
Changes in NDDI-E and GAD-7 Scores.  
**N = 116**

<table>
<thead>
<tr>
<th>Screening Instruments</th>
<th>Visit 1</th>
<th>Visit 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDDIE &gt; 15</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>GAD-7 &gt; 10</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td>NDDI-E &gt; 15 + GAD-7 &gt; 10</td>
<td>21</td>
<td>9</td>
</tr>
</tbody>
</table>

*Kanner et al, 2012; submitted.*
Should Neurologists Treat Suicidal Patients?

No!!!
Conclusions

- Prevention of suicide begins by identifying the patients with current major depressive disorder with active suicidal ideation.

- Self-rating screening instruments can be completed in an epilepsy clinic at each visit.

- Referral for treatment is associated with improvement in comorbid mood disorder and suicidality.
Impact on Clinical Care and Practice

- Identifying risks factors of suicide can be easily achieved in an outpatient epilepsy clinic.

- The most frequent obstacle to preventing suicide is not asking about it, or its risk factors!
Partner Organizations

- American Epilepsy Society
- Cure Epilepsy
- Epilepsy Foundation
- Epilepsy Therapy Project
- SUDEP Aware
- Faces
- Danny Did Foundation
- RTI International
- ICE Epilepsy Alliance
- CDC
- National Institute of Neurological Disorders and Stroke
- LGS Foundation
- The Pittsburgh Foundation