Habenula DBS in Bipolar Disorder and Comorbid Addictive Disorders: A Case Report

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Disclosures

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Introduction

- Habenula (HN) anatomy and connectivity

Implicated in reward circuitry dysfunctions

Gene Expression
- Lateral Habenula (LHb)
  - Vglut2
  - TH
  - Drd2
  - Htr2c
  - Poth1
  - Gpr151
- Medial Habenula (MHB)
  - Vglut2
  - Vglut1
  - ChAT
  - Gpr151
  - IL-1β
  - Tac1/SP
  - Oprm

Case Report

- A 46-year-old man
- Diagnosis: bipolar disorder type I, 10 years, treatment-resistant
- Comorbidities:
  1. Severe addictive disorders: Tobacco, alcohol, clonazepam
  2. Severe gambling disorder
- Disabling functional impairment
Intervention

Bilateral HN-DBS implantation

High-frequency stimulation

- Evaluations:
  1. Psychometric: HAMD, HAMA, YMRS, G-SAS, SADQ-C, FTND
  2. Quality of life: Sheehan disability scale (SDS)
  3. Neuro-cognition: CANTAB

CANTAB: Cambridge Neuropsychological Test Automated Battery
Volume-of-tissue-activated
Improvement on Psychometrics and QoL

17-item HAMD

HAMA

YMRS

FTND

G-SAS

SADQ-C

Sheehan Disability Scale

PSS-10 & PSQI

HAMD: Hamilton Depression Scale; HAMA: Hamilton Anxiety Scale; YMRS: Young Mania Rating Scale; FTND: Fagerström Test for Nicotine Dependence; G-SAS: The Gambling Symptom Assessment Scale; SADQ: Severity of Alcohol Dependence Questionnaire; PSS-10: Perceived Stress Scale-10; PSQI: Pittsburgh Sleep Quality Index
Medication reduction

Valproate

Quetiapine

Amfebutamone

Clonazepam

Lamotrigine
Potential improvement on neuro-cognition (CANTAB)

- Emotional bias more positive towards ‘Happiness’
- Planning and problem solving strategy more efficient
- Improved response inhibition
- Improved visual memory
- Improved visuo-spatial working memory
Discussion

- **First study** evaluating safety and feasibility of HN-DBS in refractory bipolar disorder with comorbid addictive disorders

- Why **nicotine dependence remained unsolved** after HN-DBS → low instead of high frequency stimulation? Medial instead of lateral HN-DBS?

- Improved neurocognitive function → primary response to HN-DBS or secondary to alleviation of psychiatric state