Lateral hypothalamic area deep brain stimulation

Lateral hypothalamic area (LHA) has been suggested as a potential treatment for intractable obesity.

Franco et al., presented case series from the Hospital das Clínicas. Four patients with genetically confirmed Prader-Willi syndrome (PWS) presenting with severe obesity were included.

Deep brain stimulation electrodes were bilaterally implanted in the lateral hypothalamic area. After DBS implantation, the treatment included the following phases: titration (1-2 months), stimulation off (2 months), low-frequency DBS (40 Hz; 1 month), washout (15 days), high-frequency DBS (130 Hz; 1 month), and long-term follow-up (6 months).

Primary outcome measures were adverse events recorded during stimulation and long-term DBS treatment. Secondary outcomes consisted of changes in anthropometric measures (weight, body mass index [calculated as weight in kilograms divided by height in meters squared], and abdominal and neck circumference), bioimpedanciometry, and calorimetry after 6 months of treatment compared with baseline. The following evaluations and measurements were conducted before and after DBS: clinical, neurological, psychiatric, neuropsychological, anthropometry, calorimetry, blood workup, hormonal levels, and sleep studies. Adverse effects were monitored during all follow-up visits.

Four patients with PWS were included (2 male and 2 female; ages 18-28 years). Baseline mean (SD) body mass index was 39.6 (11.1). Two patients had previous bariatric surgery, and all presented with psychiatric comorbidity, which was well controlled with the use of medications. At 6 months after long-term DBS, patients had a mean 9.6% increase in weight, 5.8% increase in body mass index, 8.4% increase in abdominal circumference, 4.2% increase in neck circumference, 5.3% increase in the percentage of body fat, and 0% change in calorimetry compared with baseline. Also unchanged were hormonal levels and results of blood workup, sleep studies, and neuropsychological evaluations. Two patients developed stimulation-induced manic symptoms. Discontinuation of DBS controlled this symptom in 1 patient. The other required adjustments in medication dosage. Two infections were documented, 1 associated with skin picking.

Safety of lateral hypothalamic area stimulation was in the range of that demonstrated in patients with similar psychiatric conditions receiving DBS. In the small cohort of patients with PWS treated in the study, DBS was largely ineffective [1].

1)
Franco RR, Fonoff ET, Alvarenga PG, Alho EJL, Lopes AC, Hoexter MQ, Batistuzzo MC, Paiva RR, Taub A, Shavitt RG, Miguel EC, Teixeira MJ, Damiani D, Hamani C. Assessment of Safety and Outcome of Lateral Hypothalamic Deep Brain Stimulation for Obesity in a Small Series of Patients With Prader-Willi Syndrome. JAMA Netw Open. 2018 Nov 2;1(7):e185275. doi: 10.1001/jamanetworkopen.2018.5275. PubMed PMID: 30646396.