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PO041 / #457
AURICULAR NEUROMODULATION FOR
AFFORDABLE MASS VAGUS NERVE
STIMULATION DURING THE COVID-19
PANDEMIC

E-POSTER VIEWING

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Introduction: Neuromodulation therapy based on vagus nerve stimulation, hypothesized to control both the SARS-CoV-2 replication and the ensuing inflammation, could improve the clinical outcomes as an adjunct treatment. We performed Auricular Neuromodulation (AN) by stimulating the auricular branch of the vagus nerve of COVID-19 positive inpatients with semi-permanent needles (1-8).

Materials / Methods: A bicentric, randomized, placebo-controlled, double-blind pilot study included 31 inpatients with respiratory failure due to COVID-19. They received either AN or sham neuromodulation (SN) in addition to conventional treatments. The clinical benefit conferred by AN at Day 14 was assessed by a Clinical Progression Scale (9) as well as the rate of transfer to the intensive care unit (ICU) and the survival rate.

Results: The AN procedure was well-tolerated without any reported side effects but with no significant improvement. None of the AN-treated patients died but one in the SN group did (81 years). Two AN-treated



patients (73 and 79 years) and one SN-treated patient (59 years) were transferred to ICU.

Discussion: Two major limitations could explain why AN does not appear to improve outcomes: -due to non-paired randomization, AN and PN small population are not comparable regarding age and gender, two major COVID-19 prognosis factors. -our cohort is too small to draw any firm conclusion.

Conclusions: AN was safe and could be successfully implemented during the first two waves of COVID-19 in France. It is pertinent to explore further to validate AN as an affordable mass vagal stimulation adjunct solution for pandemics (less than 10 euros and ten minutes per patient). French West Indies are about to launch a larger study.

Supplemental Data:

The fast three-step procedure for semi-permanent needles (SPN) insertion on the outer ear: (1) the blister is placed on the disinfected skin point, (2) a pressure exerted on the blister delivers the SPN inside the skin, (3) the SPN is once again sunked using the bottom end of the blister.

Picture of the 4 semi-permanent needles on the outer ear.

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Learning Objectives: 1) Can Auricular Neuromodulation be used as a safe complementary medical technique in case of a COVID-19 wave or another pandemic as a way to stimulate the cholinergic anti-inflammatory pathway? Yes: well-tolerated, cheap and fast. 2) Can Auricular Neuromodulation, used in combination with validated drugs, improve the survival of severe COVID-19 positive patients? Our pilot study was not able to answer this objective due to the small size of the population and its heterogeneity. But,



our preliminary results do not refute this objective. 3) Can Auricular Neuromodulation, used in combination with validated drugs, decrease COVID-19 positive patients ICU transfers ? Our pilot study was not able to answer this objective due to the small size of the population and its heterogeneity. Paradoxically, Auricular Neuromodulation may eventually increase ICU transfers, turning fatality cases into ICU patients.

Keywords: non-invasive neuromodulation, Public Health, auricular branch of the vagus nerve, COVID-19

PO042 / #960
CASE REPORT OF 21 Y/O. PATIENT WITH 9 YEARS OF DBS IN DYSTONIA HISTORY AND SOCIOECONOMIC OUTCOME

E-POSTER VIEWING

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Introduction: Subject was diagnosed General dystonia, and undergone GPI DBS surgery in Tyumen Federal Center of Neurosurgery, Russia. Examined through 9 (2013-2021) years after surgery. The long follow-up period and geographic difference between his city Krasnodar and Tyumen (2835) km. made it impractical to perform consistent in-person evaluations every 3 month as we planned. Social media allowed doctors to contact patient and to achieve a high responder rate.

Materials / Methods: Anamnesis: started at age in 8 (2009), with local dystonia in right hand. No family history of dystonia. For 5 years symptoms get severe, at age of 12 he had generalized dystonia. In April 2013 at age of 13 was undergone GPI DBS surgery, in November 2021 has undergone IPG replacement. To evaluate the long-term impact of DBS on BFMDRS at least once in year patient came to examination, in this moment our team did all the tests for BFMDRS dystonia, also checking and setting the DBS program. MRI in 2014 and 2021.

Table 1. Physical development, DBS programs and BMFDRS scale through 9 years of patient. Diagram 1.

Age	Year	Height (cm)	Weight (kg)	Amplitude		Pulse width		Rate		BMFDRS	
				Left	Right	Left	Right	Left	Right	ON DBS	OFF DBS
13	2013	141	33	0.9	0.8	80	90	60	60	22	90
14	2014	148	36	1.0	1.0	90	90	80	80	18	100
15	2015	154	40	1.3	1.2	120	130	80	90	20	94
16	2016	160	47	2.4	2.4	140	130	90	80	22	102
17	2017	163	50	1.8	2.0	150	140	140	1	18	96
18	2018	168	54	2.3	2.3	160	170	130	120	12	98
19	2019	170	56	2.5	2.5	170	180	150	140	11	96
20	2020	170	57	2.6	2.5	180	180	150	150	12	98
21	2021	170	57	2.6	2.5	170	180	150	150	11	98