Revista Electrónica de Biomedicina
Electronic Journal of Biomedicine

ISSN: 1697-090X

Letters to the Editor / Cartas al Editor

LANCE ADAMS SYNDROME WITH SECOND CARDIAC ARREST AND DISAPPEARANCE OF MYOCLONUS

Tariq Janjua MD[1,2], LaVertta Miller APRN[1], Luis Rafael Moscote-Salazar MD[2]

[1]Department of Critical Care Medicine, Physician Regional Medical Center, Naples, FL. USA.
[2]Colombian Clinical Research Group in Neurocritical Care, Bogota, Colombia

Email: rafaelmoscote21@gmail.com

Rev Electron Biomed / Electron J Biomed 2022;1:49-53.

Dear editor:

Cardiac arrest is the common cause of anoxic brain injury. Other reasons to have brain anoxia include severe hypotension, hypotension with limited CNS blood flow like high ICP, carbon monoxide poisoning, and strangulation. Lance et.al[1] published in 1963 the first presentation of post anoxic recovery myoclonus. The presence of myoclonus in post-cardiac arrest patients is frequently seen, though the syndrome is named after the original paper; Lance-Adams syndrome is the residual presence of myoclonus after the patient survives. The literature review was done and there is no mention of second cardiac arrest in Lance- Adams syndrome patients with the disappearance of myoclonus.

45 year old male with a preadmission history significant for hypertension, diabetes, diabetic neuropathy, necrotizing fasciitis secondary to a boating accident, and bipolar disorder admitted to the hospital a year before his present admission with shortness of breath. He was admitted with bilateral pneumonia. During this first hospitalization, he underwent surgery for left below-the-knee amputations. The day after his surgery, he was found to have difficulty breathing after which he suffered asystole cardiopulmonary arrest with ROSC being achieved after 12 minutes of resuscitation. He underwent a targeted temperature management protocol. Post hypothermia, he woke up and started following commands. He stayed on the ventilator for 12 days followed by successful extubation. In subsequent days, he suffered myoclonic jerking of his upper and lower extremities. Electroencephlaogray did not show any seizures. CT head was negative for findings consistent with anoxic brain injury. MRI brain was not possible at that stage due to concern for hardware for a history of cervical spine surgery. He was able to follow commands, and move his extremities independently with intermittent myoclonic jerking, track movement, and garbled, incoherent speech. He was discharged to rehab and eventually home but required total care from his mother. A clinical diagnosis of Lance-Adams syndrome was made and symptomatic treatment was initiated.

He was brought to the emergency department after the second asystole cardiac arrest followed by pulseless electrical activity at home. ROSC was achieved on arrival to ED after 5 rounds of CPR following ACLS protocol. Per his mother, his baseline mental status prior to arrest was intermittently following commands and ability to express himself. He was intubated and subsequently underwent targeted temperature management protocol in the intensive care unit.

After completion of hypothermia, he stayed in a coma without any sedation. The myoclous due to Lance-Adams syndrome was not present. His eyes opened up and was able to track but not able to follow commands or move extremities. CT head did not show any active process. Brain MRI was able to be done showing minimal small vessels with subtle ischemic changes. EEG was negative for any seizures with marked encephalopathic changes. Over the next many days, there was no change and the family proceeded to terminal extubation and terminal care.e

Since first report of 4 cases in 1963[1], over 150 cases are reported in the literature. Review of the literature showed that there are 80 published papers specfic for this condition. Most dealing with the case reports and therapies used to manage mycolonus and rehabliatation. The key feature of this diagnosis is recovey from an anoxic event. It is usually seen after cardiac arrest[2-7], but other causes mentioned inculde snakebite envenomation[8], COVID-19 induced hypoxemia[9], infective endocarditis[10], and strangulation[11]. There is no one clear decided therapy to control myoclonus in these patient. Our patient was on valporic acid and it was stopped post 2nd arrest due to absence of myoclonus. Therapies tried and mentioned in the literature include Perampanel[12-17], deep brain stimulation[18-22], sodium oxybate[23,24], cannabidiol[25], volatile anesthetic agent[26], Levatiracetam[27,28], Gamma-hydroxybutyrate[29], L-5-hydroxytryptophan[30], piracetam[31], levodopa[32], intrathecal baclofen[33], lacosamide[34], and valproic acid[35-37]. The treatment inculdes therapy as our patient was getting at home after first cardiac arrest. The disapperance of myoclonus was thought to be due to second insult and injury to deep gray matter. Although MRI did not show extensive anoxic changes, patient continued to require intubation to protect his airway and not following command. This case is the first reported case where a second cardiac arrest happened in a patient with established diagnosis of Lance-Adams syndrome and his mycolonus was absent after ROSC was achieved.

REFERENCES

1.- Lance JW, Adams RD. The syndrome of intention or action myoclonus as a sequel to hypoxic encephalopathy. Brain. 1963;86:111-136.

2. Moreira Filho PF, Freitas MR, Camara V, Quaglino E, Sarmento R. Post-anoxic myoclonic encephalopathy (Lance-Adams syndrome): report of 6 cases (Portuguese) Arq Neuropsiquiatr. 1981;39(2):162-73.

3.- Yamaoka H, Tomemori N, Hayama K. The Lance-Adams syndrome following cardiopulmonary resuscitation: A report of two cases. J Anesth. 1994;8(3):349-351.

4.- Ah-Reum Cho, Jae-Young Kwon, Joo-Yun Kim, Eun-Soo Kim, Hee-Young

Kim. Acute onset Lance-Adams syndrome following brief exposure to severe hypoxia without cardiac arrest - a case report. Korean J Anesthesiol. 2013;65(4):341-344.

5.- Ferlazzo E, Gasparini S, Cianci V, Cherubini A, Aguglia U. Serial MRI findings in brain anoxia leading to Lance-Adams syndrome: a case report. Neurol Sci. 2013;34(11):2047-2050.

6.- Irene Aicua Rapun, Jan Novy, Daria Solari, Mauro Oddo, Andrea O Rossetti. Early Lance-Adams syndrome after cardiac arrest: Prevalence, time to return to awareness, and outcome in a large cohort. Resuscitation. 2017;115:169-172.

7.- Kiran K Gudivada, Cherian Roy, Manu M K Varma. Lance-Adams Syndrome after Cardiac Arrest. Neurol India. 2022;70(1):166.

8.- Ritwik Ghosh, Arpan Maity, Uttam Biswas, Shambaditya Das, Julián Benito-León. Lance-Adams syndrome: An unusual complication of snakebite envenomation. Toxicon. 2022;209:50-55.

9.- Rabia Muddassir, Abdelrahman Idris, Noura Alshareef , Ghaidaa Khouj, Rimaz Alassiri. Lance Adams Syndrome: A Rare Case Presentation of Myoclonus From Chronic Hypoxia Secondary to COVID-19 Infection. Cureus. 2021;13(12):e20321.

10.- E Val-Jordan, P Gutierrez-Ibanes, V Bertol-Alegre, M Gurpegui-Puente. Lance-Adams syndrome after infective endocarditis (Spanish). Rev Neurol. 2017-;64(10):479.

11.- S Jain, M Jain. Action myoclonus (Lance-Adam syndrome) secondary to strangulation with dramatic response to alcohol. Mov Disord. 1991;6(2):183.

12.- Steinhoff BJ, Bacher M, Kurth C, Staack AM, Kornmeier R. Add-on perampanel in Lance-Adams syndrome. Epilepsy Behav Case Rep. 2016 Jun 1;6:28-9.

13.- Lim SY, Jasti DB, Tan AH. Improvement of "Bouncy Gait" in Lance-Adams Syndrome with Perampanel. Cureus. 2020;12(1):e6773.

14.- Saito K, Oi K, Inaba A, Kobayashi M, Ikeda A, Wada Y. A case of the successful treatment of severe myoclonus with Lance-Adams syndrome by add-on perampanel showing long term effects (Japense) . Rinsho Shinkeigaku. 2021;61(1):18-23.

15.- Katsuki M, Narita N, Yasuda I, Tominaga T. Lance-Adams Syndrome Treated by Perampanel in the Acute Term. Cureus. 2021;13(3):e13761.

16.- Stubblefield K, Zahoor S, Sonmezturk H, Haas K, Mattingly D, Abou-Khalil B.Perampanel is effective against Lance-Adams syndrome. Epileptic Disord. 2021 Oct 1;23(5):769-771.

17.- Saita D, Oishi S, Saito M. Administration of a small dose of perampanel improves walking ability in a case of Lance-Adams Syndrome. Psychiatry Clin Neurosci. 2022;76(3):89.

18.- Yamada K, Sakurama T, Soyama N, Kuratsu J. Gpi pallidal stimulation for Lance-Adams syndrome. Neurology. 2011 Apr 5;76(14):1270-1272.

19.- Asahi T, Kashiwazaki D, Dougu N, Oyama G, Takashima S, Tanaka K, Kuroda S. Alleviation of myoclonus after bilateral pallidal deep brain stimulation for Lance-Adams syndrome. J Neurol. 2015;262(6):1581-1583.

20.- Mure H, Toyoda N, Morigaki R, Fujita K, Takagi Y. Clinical Outcome and Intraoperative Neurophysiology of the Lance-Adams Syndrome Treated with Bilateral Deep Brain Stimulation of the Globus Pallidus Internus: A Case Report and Review of the Literature. Stereotact Funct Neurosurg. 2020;98(6):399-403.

21.- Kim MJ, Park SH, Heo K, Chang JW, Kim JI, Chang WS. Functional Neural Changes after Low-Frequency Bilateral Globus Pallidus Internus Deep Brain Stimulation for Post-Hypoxic Cortical Myoclonus: Voxel-Based Subtraction Analysis of Serial Positron Emission. Brain Sci. 2020;10(10):730.

22.- Gao F, Ostrem JL, Wang DD. Treatment of Post-Hypoxic Myoclonus using Pallidal Deep Brain Stimulation Placed Using Interventional MRI Methods. Tremor Other Hyperkinet Mov (N Y). 2020;10:42.

23.- Arpesella R, Dallocchio C, Arbasino C, Imberti R, Martinotti R, Frucht SJ. A patient with intractable posthypoxic myoclonus (Lance-Adams syndrome) treated with sodium oxybate. Anaesth Intensive Care. 2009;37(2):314-8.

24.- Riboldi GM, Frucht SJ. Increasing Evidence for the Use of Sodium Oxybate in Multi-Drug-Resistant Lance-Adams Syndrome. Tremor Other Hyperkinet Mov (NY). 2019 Jun 17;9.

25.- Zöllner JP, Noda AH, Rosenow F, Strzelczyk A. Improving post-hypoxic myoclonus using cannabidiol. Seizure. 2019;67:38-39.

26.- Rayadurg V, Muthuchellappan R, Rao U. Volatile anesthetic for the control of posthypoxic refractory myoclonic status. Indian J Crit Care Med. 2016;20(8):485-488.

27.- Ilik F, Kemal Ilik M, Cöven I. Levatiracetam for the management of Lance-Adams syndrome. Iran J Child Neurol. 2014;8(2):57-59.

28.- Boži? K, Gebauer-Bukurov K, Sakalaš L, Divjak I, Ješi? A. Improvement of post-hypoxic action myoclonus with levetiracetam add-on therapy: A case report. Vojnosanit Pregl. 2014;71(5):515-519.

29.- Menon MK. Gamma-hydroxybutyrate in experimental myoclonus. Neurology. 1982;32(4):434-437.

30.- Satoyoshi E, Kinoshita M, Takazawa Y, Yoda K. [Case of intention myoclonus (Lance-Adams syndrome) and a dramatic effect of L-5-hydroxytryptophan (Japanese). Rinsho Shinkeigaku. 1976;16(9):654-660.

31.- Hoshino A, Kumada S, Yokochi F, Hachiya Y, Hanafusa Y, Tomita S,

Okiyama R, Kurihara E. Effects of piracetam therapy in a case of Lance-Adams syndrome (Japense). No To Hattatsu. 2009;41(5):357-60.

32.- Coletti A, Mandelli A, Minoli G, Tredici G. Post-anoxic action myoclonus (Lance-Adams syndrome) treated with levodopa and GABAergic drugs. J Neurol. 1980;223(1):67-70.

33.- Birthi P, Walters C, Ortiz Vargas O, Karandikar N. The use of intrathecal baclofen therapy for myoclonus in a patient with Lance Adams syndrome. PM R. 2011;3(7):671-3.

34.- Galldiks N, Timmermann L, Fink GR, Burghaus L. Posthypoxic myoclonus (Lance-Adams syndrome) treated with lacosamide. Clin Neuropharmacol. 2010;33(4):216-7.

35.- Rollinson RD, Gilligan BS. Postanoxic action myoclonus (Lance-Adams syndrome) responding to valproate. Arch Neurol. 1979;36(1):44-45.

36.- Wicklein EM, Schwendemann G. Use of clonazepam and valproate in patients with Lance Adams syndrome. J R Soc Med. 1993;86(10):618.

37.- Liron L, Chambost M, Depierre P, Peillon D, Combe C. Effectiveness of valproic acid for postanoxic action myoclonus (Lance- Adams syndrome) (French). Ann Fr Anesth Reanim. 1998;17(10):1247-9.

CORRESPONDENCE:
Luis Rafael Moscote, MD
Colombian Clinical Research Group in Neurocritical Care,
Bogota, Colombia
Email: rafaelmoscote21@gmail.com

Tariq Janjua, MD
Department of Critical Care Medicine,
Physician Regional Medical Center,
Naples, FL. USA
Email: icumd@outlook.com

Received: 25/06/2022
Published: 23/06/2022