Use of Visceral mobilization (diaphragm mobilization) Treatment to Manage Recurrent Bouts of Singultus

DR. ZUHAIRA FARUQUI[1], JHARNA DEVI[2], SAMREEN IQBAL[3], UNAIZA. A. HAMEED[4], SIDRA KHAN[5] and SARANG RAZA[6]

[1]Senior Physiotherapist, Ziauddin Hospital Clifton, Email: zaya71@hotmail.com
[2]Clinical Manager physiotherapy, Ziauddin Hospital Clifton, Email: jdodani@gmail.com
[3]Asst. Manager Physiotherapy, Ziauddin Hospital Clifton, Email: samreen40@yahoo.com
[4]Senior Physiotherapist, Ziauddin Hospital Clifton
[5]Senior Physiotherapist, Ziauddin Hospital Clifton
[6]Physiotherapist, Ziauddin Hospital Clifton, Email: sarangrazamalik@gmail.com

CASE REPORT:

Hiccups or singultus are defined as the involuntary spasm of the diaphragm that are not harmful and cease themself in most of the cases. Treatment are needed for only those cases that persist longer. Present treatment choices are various including pharmaco-therapeutics, complementary techniques like osteopathic techniques and acupuncture.

A 72-yearold man suffering with Stiff Person Syndrome and concurrent Aminoacidopathy, was referred with multiple attacks of singultus of duration, ranging from 20 minute to 5 hours, daily. Visceral mobilization (diaphragm mobilization) was used as the treatment intervention at the onset of spasm. The Singultus were immediately ceased and didn't occur further for the next 12 hours. Overall, it was noted that the frequency, duration, and intensity of the singultus was reduced. Moreover, the tolerance for physical therapy treatment was also increased. This article theorizes that VM could be used as a useful tool or in place of pharmacologic treatment for singultus, or in which pharmacologic therapies have failed to achieve the desired results.[3,4]

The term Singultus is used for "an involuntary, intermittent, spasmodic contraction of the diaphragm and intercostal muscles.[1,2]" According to definition singultus may be divided into four types: acute, persistent, chronic and intractable. Mostly, acute singultus are hiccups that last less than 2 days, persistent persists for more than 2 days, chronic lasts longer than a week, and intractable more than 4 weeks.[5] Here we are describing a patient who had repeated bouts of singultus that it responds to VM (diaphragm mobilization).

Report of Case

A 72-year-old male visited a Tertiary care academic medical center. He was diagnosed ileus andalso experiencing prolonged nausea and vomiting, Stiff Person Syndrome (glutamic acid decarboxylase [GAD]-65 antibodies negative), mitochondrial Amino-acidopathy, Associated Postural Tachycardic Syndrome and Spasms in whole body since 2008.

First onset of singultus occurred a year ago and demonstrated as frequently reoccurring bouts. Most oftenly, it occurs when he used to be in erect upright posture or when he flexed in forward direction. These episodes would last for 20 minutes to 5 hours and then spontaneously ceased. Various drugs, like baclofen, ondansetron, metaclopramide, and carbemazepine, were used but remain ineffective in reducing the duration, frequency, or intensity of singultus. After three weeks of the onset of the first singultus, an event of intractable singultus developed.

Patient had been referred to a Physiotherapy Doctor who conducted a structural assessment. As a result, asymmetry, restriction of motion, tenderness in neck, T1-T4 and T10-T12 levels of thoracic vertebrae, sacrum and pelvic regions was revealed. Physiotherapist then applied VM (diaphragm mobilization) using rib raising maneuver, diaphragmatic balanced ligamentous tension maneuver, and diaphragmatic doming maneuver of the left hemi-diaphragm. This resulted in the instantaneous cessation of singultus. VM was performed only once a time while in the period of singultus remission, another procedure i.e. manipulation, was applied to the thoracic spine. Tissue texture, asymmetry, tenderness and restriction of motion was resolved after manipulation. After application VM , therapist observed that this patient was having increased tolerance of upright posture and flexion in forward direction. He had achieved a modified level of self-dependence, with self-feeding, dressing of upper extremities, and independent sitting, which he was not able to do previously. However, this elderly patient did not come for follow up afterwards in OPD.

Discussion and Review of the Literature

Mostly, singultus is considered to be the spasm of the left hemidiaphragm but the available knowledge about its pathophysiology is very limited[6,7]. A study claimed physiological reflex arc originating from Vagsu and phrenic nerves, centrally acting mediators, efferent limb of phrenic nerve and connections of intercostal muscles and glottis to be the underlying cause of singultus. These connections were poorly defined. However, some parts of brain including medulla oblongata, phrenic nuclei, reticular formation and hypothalamus may be involved[8,9]. Moreover, CNS were involved in only a few cases of singultus[9]. In this case singultus was exacerbated by the flexion of either shoulder or sitting upright. It is though speculated, but might be due to the engagement of serratus anterior muscle while forward bending and involvement of para-spinal muscles in erect sitting posture. All of these share common origins in rib cage.

The management of Singultus is actually governed by its cause. Therefore, it is necessary to make reasonable attempts to treat the cause. For instance, when a medicine is found to be the reason, it should be avoided. When there is no specific cause identified, various CNS stimulating or suppressing drugs may be used for the empirical treatment of singultus. Moreover, chlorpromazine which is an antipsychotic medicine is supported by some literature sources as the drug of choice in initial maangement of singultus.[10,11] Other drugs include Baclofan, Metaclopramide, Anticonvulsants, Methyl pehnidate, Amantadine, Quinidine, Alanzafine, Tricyclic antidepressants, amentadine. Acupunture therapy have also demonstrated positive outcomes for the management of singultus. [12, 13]. Similarly, acupuncture was compared with Methyl phenidate in a study, conducted on 80 patients in China and found that acupuncture and traditional cupping had superior results. 10 However, a

systemic review was unsuccessful to explain the efficacy of pharmacologic and other interventions to achieve conclusive results.

There is no sufficient evidence available to give clear instructions for the treatment of persistent or intractable singultus with either medicinal or non-medicinal interventions. The lack of strong evidence studies indicates a need for randomized placebo-controlled trials on pharmacological as well as non-pharmacological treatment to achieve conclusive result.

In our knowledge there have been no studies which have investigated the efficacy of VM in patients with recurrent neurogenic singultus, although its use as treatment for patients with singultus has been reported.[14,15] Physical methods have been used for the treatment of singultus since olden days. However, very little amount of evidences is available. In 19th century, Sir William Osler applied traction on tongue to treat chronic singultus.[16] Other previous methods include pulling knees to chest to irritate diaphragm, using Valsalva Maneuver to increase Vagal tone, interrupted respirations, drinking of cold water and stimulating uvula but only weak evidence is available.[1,17,18.]

Previously, no study had been conducted on visceral mobilization for the management of singultus in Karachi, Pakistan. Osteopathic practice provides the basis for the VM (Diaphragm Mobilization) for the treatment of singultus. Diaphragmatic maneuver of VM technique stretched the muscular fibers of diaphragm which prevent muscular contraction resulting in cessation of spasm. Rib Rising maneuver maintains the balance of sympathetic stimulus and decrease diaphragmatic irritation by the inhibition of intercostal muscles. When there is phrenic nerve irritation due cervical dysfunction, the treatment would involve resolution of cervical dysfunction. Resolution of sympathetic and parasympathetic innervation modulates vagal tone and inhibits reflex arc. Similarly, Balance Ligamentous Tension maneuver balances ligament, tendon and muscular attachments around the diaphragm. Therefore, a change in posture decreases the frequency, duration and intensity of singultus.

Conclusion

According to our knowledge, this study is the first clinical trial on VM (diaphragm mobilization) for the management of singultus in Karachi. However, further studies are required to be conducted in order to provide evidence for the use of VM as a treatment of singultus, especially when medicine fails to achieve the desired results. Moreover, VM is a safe alternative treatment to conventional interventions, which may have good results.

References

1. Kolodzik PW, Eilers MA. Hiccups (singultus): review and approach to management. Ann Emerg Med. 1991;20(5):565-573.

2. Guelaud C, Similowski T, Bizec JL, CabaneL, Whitelaw WA, Derenne JP. Baclofen therapy for chronic hiccup. EurRespir J. 1995;8(2):235-237.

3. Smith HS, Busracamwongs A. Management of hiccups in the palliative care population. Am J HospPalliat Care. 2003;20(2):149-154.

4. Sleszynski SL, Glonek T, Kuchera WA. Outpatient osteopathic single organ system musculoskeletal exam form series: validation of the outpatient osteopathic SOS Musculoskeletal Exam Form, a new standardized medical record. J Am Osteopath Assoc.

2004 Oct;104(10):423-38.

5. Ward RC, ed. Foundations for Osteopathic Medicine. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2002.

6 Samuels L. Hiccup; a ten year review of anatomy, etiology, and treatment. Can Med Assoc J. 1952;67(4):315-322.

7. Straus C, Vasilakos K, Wilson RJ, et al. A phylogenetic hypothesis for the origin of hiccough. BioEssays. 2003;25(2):182-188.

8. Kobayashi Z, Tsuchiya K, Uchihara T, et al. Intractable hiccup caused by medulla oblongata lesions: a study of an autopsy patient with possible neuromyelitisoptica. J Neurol Sci. 2009;285(1-2):241-245.

9. Chang FY, Lu CL. Hiccup: Mystery, Nature and Treatment. J NeurogastroenterolMotil. 2012;18(2):123-130.

10. Lembo AJ. Overview of hiccups. In: Aronson MD, Lin FH, eds. UpToDate. Waltham, MA: Walters Kluwer; 2013. http://www.uptodate.com/contents/overview-of-hiccups. Accessed June 16, 2014.

11. Marinella MA. Diagnosis and management of hiccups in the patient with advanced cancer. J Support Oncol. 2009;7(4):122-127.

12. Hongliang X, Xuemei C, Shizhao H, Chaofeng L. Acupuncture and cupping for treatment of hiccup in cases of cerebrovascular accident. J Tradit Chin Med. 2006;26(3):175-176.

13. Xing JW, Pan CM. Acupuncture at Xinshepoint for 30 cases of intractable hiccups. Zhongguo Zhen Jiu. 2013;33(4):324.

14. Moretto EN, Wee B, Wiffen PJ, Murchison AG. Interventions for treating persistent and intractable hiccups in adults. Cochrane Database Syst Rev. 2013;1:CD008768. doi:10.1002/14651858.CD008768.pub2.

15. Kwan CS, Worrilow CC, Kovelman I, Kuklinski JM. Using sub occipital release to control singultus: a unique, safe, and effective treatment. Am J Emerg Med. 2012;30(3):514:e5-e7.

16. Petroianu GA. Treatment of singultus by traction on the tongue: an eponym revised. J HistNeurosci. 2013;22(2):183-190. doi:10.1080/0964704X.2012.728389.

17. Friedman NL. Hiccups: a treatment review. Pharmacotherapy. 1996;16(6):986-995.

18. Viera AJ, Sullivan SA. Remedies for prolonged hiccups. Am Fam Physician. 2001;63(9):1684,1686.