Clinical study of Cervicogenic Headache

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ABSTRACT

Introduction. The cervicogenic headache was studied to get a deeper insight into the pathogenetic mechanisms, and clinical presentation forms. Material and Methods. Eleven female patients, ranging from 34 to 81 years-old, with cervicogenic headaches, were studied and correlated with NMR images of the cervical spine. Results. Intense neck pain irradiated to parietal, occipital, temporal regions, and shoulders were correlated with NMR images of the degenerated cervical spine. Also, lumbar spine pathology, osteoporosis, gallstones, and cholecystitis were found. The following associated neurological, neurobehavioral, and metabolic diseases comorbidities were observed, such as blood hypertension, diabetes, obesity, hypothyroidism, partial epilepsy, tremor, familial stress, memory, sleep disorders, and dizziness. Also, we found mixed cervicogenic headaches and migraines in 50% of cases studied. Conclusion. The headache and the associated images of cervical pathology have been clinically interpreted as cardinal signs of cervicogenic headache. A mixed cervicogenic mixed type was observed.

Key Words: Mixed cervicogenic headaches, Migraine, Diagnosis, Criteria.

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INTRODUCTION

According to Haldeman and Dahenais [1], cervicogenic headache is a term used to relate cervical tissue pathology and headache. Hülse and Seifert [2] express that several neurologists do not consider cervicogenic headache as a recognized pathological condition. On the contrary. Vincent [3] considers that cervicogenic headache (CGH) is a well-recognized syndrome that should be differentiated from migraine and tension-type headache. Migraine is a common neurological disorder [4-6]. Bogduk [7-9] postulates that a precise diagnosis requires the presence of evident cervical lesion damage. Frese et al (2003) [10] conclude that CGH is a functional entity originated by a cervical dysfunction. Becker (2010) [11] found that the cervical region contains many pain-sensitive structures inducing frontal and ocular pain.

The present case research study describes eleven patients with cervicogenic headaches (CGH) and mixed cervicogenic headaches and migraine, and pathological diseases of the cervical spine, associated to neurological, neurobehavioral, and metabolical diseases, in an attempt to get a deeper insight into the pathogenesis of CGH.

MATERIAL AND METHODS

Eleven patients ranging from 34 to 81 years old were studied at the Clinical Neuroscience Outpatient Clinic of Clinical Neuroscience Institute. Maracaibo. Venezuela. San Rafael Clinical Home and the Biological Research Institute. Faculty of Medicine, Zulia University. Cervicogenic headaches and associated pathologies were diagnosed according to the International Headache Society-IIIb criteria. The Helsinki declaration principles for research in human beings were adopted.

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RESULTS

Case report study

Case 1. EO, 54 years old, F. Neck pain irradiated to occipital and temporal regions, shoulders, and backward. Blood hypertension, hypothyroidism, dizziness. Familial Stress. Degenerative disc disease of the cervical and lumbar spine.

Diagnosis: Mixed Cervicogenic headache. Hypothyroidism and Blood hypertension.

Case 2. CB, 81 years old, F. Intense holocraneal headache irradiated to neck and

Backward. Blood hypertension. Diabetes. Obesity. Cervical osteophytes and osteoporosis, gallstones and cholecystitis

Diagnosis: Mixed Cervicogenic headache

Case 3. MO, 34 years old. F. Intense headache irradiated to the neck, partial seizures and oculogyric crisis, fine involuntary movements of right arm and limb, mood changes. NMR images showed discal protrusion of the cervical spinal cord at the level of C3 and C4. The patient received anti-conceptive treatment.

Diagnosis: Cervicogenic headache, partial epilepsy, and involuntary movements.

Case 4. YP, 47 years old, F. Neck pain referred to head since five years ago. Photophobia and scintillating scotoma, blurred vision, subcutaneous hematomas in arms and legs. Dyslipidemia, polyuria, polydipsia. Normal blood pressure.

Diagnosis: Mixed Cervicogenic headache and migraine and dyslipidemia

Case 5. EB, 37 years old, F. Neck pain irradiated to head and shoulders inducing holocraneal headache, left eye pain, blood hypertension, dizziness, sleep apnea, memory disorders, and vision disturbances,

Diagnosis of Mixed Cervicogenic headache and migraine.

Case 6. VL, 51 years-old, F. Intense neck pain, and temporo-occipital headache and transitory loss of consciousness irradiated to the right arm, dizziness, vertigo, sonophobia. NMR images showed multisegmental cervical osteopathy and arthropathy with non-compressive posterior disc displacement.

Diagnosis: Mixed Cervicogenic headache and migraine. Cervical osteopathic and arthropathy

Case 7. JL, 54 years-old, F. Holocraneal headache and neck pain irradiated to head and shoulders after motor vehicle accident (Whiplash injury). Hyperthyroidism, tachycardia, depression, familial stress, conjugal separation, and insomnia. NMR images showed posterior protrusion of intervertebral disc at C5 and C6 with compression of the spinal cord.

Diagnosis: Cervicogenic headache and posttraumatic headache, hyperthyroidism, and depression, and protrusion of intervertebral disc at C5 and C6 with compression of the spinal cord.

Case 8. MM, 44 years-old, F. Chronic cervicogenic headache for eight years, blood hypertension, and hypertensive crisis, memory disorders, depression, dyslipidemia. Cervical RMN images showed cervical degenerative discopathy without disc protrusions. Lumbar RNM images depicted chronic radicular motor lesions

Diagnosis: Chronic cervicogenic headache, high blood pressure, memory disorders, depression, dyslipidemia.

Case 9. MO, 34 years-old. F Intense daily headache and cervical pain, partial epilepsy, depression, tremor in right hand and leg, cold sweat, mood changes, sleep disorders. NMR images showed prominent disc protrusion at C3-C4 levels. Prominent Magna cistern and right rotation of the dorsal spine.

Diagnosis: Mixed cervicogenic headaches, partial epilepsy, depression, tremor in the right hand, and leg interpreted as parkinsonism.

Case 10. EO, 54 years-old, F. Holocraneal headache irradiated to the facial region and shoulders, neck pain, dizziness, hypothyroidism, high blood pressure, tachycardia. NMR images showed degenerative discopathy of cervical, dorsal, and lumbar vertebral column.

Diagnosis: Mixed cervicogenic headache, hypothyroidism, and high blood pressure.

Case 11. MN, 56 years old, F. Intense headache and neck pain, high blood pressure, diabetes, Fat liver. Gall lithiasis and cholecystitis. NMR images showed the curvature of the cervical spine, osteophytes, and osteoporosis.

Diagnosis: Cervicogenic headache, diabetes, liver and gall bladder pathology, a curvature of the cervical spine, osteophytes, and osteoporosis.

Interpretation of results

The above clinical study showed patients, ranging from 34 to 81 years old, with intense headaches and the neck as a source of intense pain irradiated to occipital and temporal regions and backward, and NMR images of cervical and lumbar pathology, osteoporosis, gallstones and cholecystitis, The following associated comorbidities were found including neurological, and neurobehavioral, such as partial epilepsy, tremor, familial stress, memory, sleep disorders, dizziness, and metabolic diseases such as diabetes, obesity, and hypothyroidism. Also, we found a mixed type of cervicogenic headache and migraine, cervicogenic headache, and posttraumatic headache (whiplash injury by a motor vehicle accident). The cervical headache and the associated images of cervical pathology have been clinically interpreted as cardinal signs of cervicogenic headache diagnosis.

DISCUSSION

In the present paper we have studied eleven adult and aging patients, ranging from 34 to 81 years old with cervicogenic headache suggesting that age is an important factor for

degenerative changes of cervical spine and muscle dysfunction [12]. Primary sensory afferents from the cervical roots C1-C3 converge with afferents from the occiput and trigeminal afferents on the same second-order neuron in the upper cervical spine as the neural correlates of CGH. Thus the cervical facet joints, cervical intervertebral discs, skeletal muscles, connective tissues, and neurovascular structures appear implicated in the genesis of cervicogenic headache [7-10, 13-16]. According to Gasik, (2008) [17], the pain may spread to the neck, occipital area of the skull, area of jaw and eyeballs, and arms. Baron et al. [18] postulate that cervicogenic headache frequently coexists with complaints of dizziness, tinnitus, nausea, imbalance, hearing complaints, and ear/eye pain supporting similar findings found in the patients under study.

Iskra et al. (2019). [19] establish a manual differential diagnosis between cervicogenic headaches and migraine taking into account the manipulative effects on the neck region, which induce higher pain in CGH than in migraines. Shen et al. (2019) [20] reported bilateral pain in temporal, occipital, and orbit regions. A notable portion of patients with cervicogenic headaches can have an atypical presentation which can be explained by the discogenic, convergence, and sensitization-desensitization theories [15].

Avigan et al. (2020) [21] made a systematic review evidencing the heterogeneity in the clinical characteristics used to diagnose CGH in participants recruited in randomized controlled trials and how well the diagnostic criteria used to align with the most recent edition (3rd) of the International Classification of Headache Disorders.

According to Jull et al. (2007) [22], musculoskeletal disorders are considered the underlying cause of cervicogenic headache, but neck pain also is found commonly associated with migraine and tension-type headaches. Becker (2010) [11] considers that painful disorders of the neck can give rise to headaches and that the challenge is to identify these patients and treat them successfully.

Clinical studies have shown that zygapophysial joint pain is very common among patients with chronic neck pain after whiplash and that this pain can be successfully eliminated by radiofrequency neurotomy [23].

Racicki et al. (2013) [24] found that cervicogenic headache affects 22-25% of the adult population with females being four times more affected than men. According to La Grew et al. (2019) [25], those diagnosed with cervicogenic headaches were more likely to be female. In our study, we found cervicogenic headache in female patients (100%).

Cervicogenic headache and dizziness

We have reported dizziness in five patients with CGH (50%). Cervicogenic dizziness (CGD) is hard to diagnose as there is no objective test (La Grew et al., 2019) [25]. According to Reid et al. (2013) [26], the cervicogenic cephalic syndrome (CCS) comprises a group of diseases, consisting of cervicogenic headache and dizziness.

Cervicogenic headache and blood hypertension

In the present study, we have found blood hypertension in five patients with CGH (50%). According to Vincent [3], CGH may also depend on a central predisposition counterpart, leading to the activation of the trigeminovascular system and pain generation

Cervicogenic diseases and metabolic diseases

Metabolic diseases such as hypothyroidism, diabetes, and obesity were found in the patients examined, which can be considered precipitating risk factors in the elderly population. We have not found previous reports on cervicogenic headaches and comorbidity with these metabolic entities.

Cervicogenic diseases and vertigo

We have found vertigo in one patient with a cervicogenic headache. Thompson-Harvey and Hain (2018) [27] identify patient features distinguishing cervical vertigo from vestibular causes of vertigo and vestibular migraine. Pollak and Pollak, (2014) [28] postulate that headache is also frequent in benign paroxysmal positional vertigo (BPPV).

Mixed cervicogenic headache and migraine

The presence of photophobia, sonophobia, scintillating scotoma, blurred vision, dizziness, and vomits in the patients examined were interpreted as symptoms related to migrainous traits [9] present in the patients herein examined and classified as the mixed type cervicogenic headache and migraine.

Cervicogenic headache and neurobehavioral disorders

We have reported depression in three cases with CGH and in one case with the stress-related disorder. A similar symptom was observed by Martins et al. (2012) [29] in chronic posttraumatic headaches. Presumably, this association is related to the hypothesis that estrogens have a role in the pathophysiology of both disorders, as have been postulated by Peterlin et al. (2009) [30] between migraine and depression. Until now, the studies into the possible mechanisms underlying these associations remain limited. Prospective epidemiological studies suggest a common genetic, biochemical, or environmental background behind primary headaches and depression. This theory is supported by the role of the same neurotransmitter systems (mostly serotonin and dopamine) in headaches as well as in depression [31]. Pain, anxiety, and depression also are comorbidities in migraine [32-34]. Furthermore, it is a common belief that in migraine without aura neck symptoms frequently occur and that both entities

may pathogenetically be intimately related [35]. (Sjaastad, 2008).

Cervicogenic headache and Whiplash injury

We have observed a patient with whiplash injury after a car accident. This variety of cervicogenic headaches has been earlier studied by Drottning et al. (2007) [36] and Peterling et al (2009) [30] who clarify the long-term natural course of cervicogenic headache (CGH) after a whiplash injury.

CONCLUSIONS

Intense neck pain originated from cervical structures of female patients irradiated to parietal, occipital, temporal regions and shoulders, is correlated with NMR images of the degenerated cervical spine. Neurological, neurobehavioral, and metabolic diseases comorbidities were observed. The cervical headache and the associated images of cervical pathology have been clinically interpreted as cardinal signs of cervicogenic headache. A mixed cervicogenic mixed type was observed in 50% of patients studied.

Conflict of interest:

Authors refer do not have conflicts of interests.

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