Available online at www.sciencedirect.com

ScienceDirect

Chronic Diseases and Translational Medicine 3 (2017) 186–190

www.keaipublishing.com/en/journals/cdtm/

www.cdatm.org

Original Article

Restless legs syndrome secondary to pontine infarction: Clinical analysis of five cases

Hou-Zhen Tuo [a,*], Ze-Long Tian [b], Yi-Nong Cui [a], Xiao-Yang Ma [c], Chun-Ling Xu [a], Hong-Yan Bi [a], Li-Yan Zhang [a], Yong-Bo Zhang [a], Wei-Dong Le [d], William Ondo [e,**]

[a] *Department of Neurology, Capital Medical University Affiliated Beijing Friendship Hospital, Beijing 100050, China*

[b] *Department of Neurology, The Fourth Central Hospital of Tianjin, Tianjin 300140, China*

[c] *Department of Neurology, Beijing Ditan Hospital, Capital Medical University, Beijing 100015, China*

[d] *The Center for Translational Research on Neurological Diseases, The First Affiliated Hospital of Dalian Medical University, Dalian, Liaoning 116011, China*

[e] *Department of Neurology, Methodist Neurological Institute, Houston, TX 77030, USA*

Received 4 July 2017

Available online 1 September 2017

Abstract

Objective: Pontine infarction is a common type of stroke in the cerebral deep structures, resulting from occlusion of small penetrating arteries, may manifest as hemi-paralysis, hemi-sensory deficit, ataxia, vertigo, and bulbar dysfunction, but patients presenting with restless legs syndrome (RLS) are extremely rare. Herein, we reported five cases with RLS as a major manifestation of pontine infarction.

Methods: Five cases of pontine infarction related RLS were collected from July 2013 to February 2016. The diagnosis of RLS was made according to criteria established by the International RLS Study Group (IRLSSG) in 2003. Neurological functions were assessed according to the National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS). Severity of RLS was based on the International RLS Rating Scale (IRLS-RS). Sleep quality was assessed by Epworth Rating Scale (ERS), and individual emotional and psychological states were assessed by Hamilton Depression Scale (HDS) and Hamilton Anxiety Scale (HAS).

Results: The laboratory data at the onset including hemoglobin, serum concentration of homocysteine, blood urea nitrogen (BUN), creatinine, electrolytes, and thyroid hormones were normal. The electroencephalogram (EEG), lower-extremity somatosensory evoked potential (SEP), and nerve conduction velocity (NCV) in four limbs were normal. The average period of follow-up was 34.60 ± 12.76 months. The MRI examination showed acute or subacute pontine infarction lesions, 3 cases in the rostral inner side, 1 case in the rostral lateral and inner side, and 1 case in rostral lateral side. The neurological deficits included weakness in 4 cases, contralateral sensory deficit in 1 case, and ataxia in 2 cases. All 5 patients presented with symptom of RLS at or soon after the onset of infarction and 4 patients experienced uncomfortable sensations in the paralyzed limbs contralateral to the ischemic lesion. Their

* Corresponding author.

** Corresponding author.

E-mail addresses: tuohzh@sina.cn (H.-Z. Tuo), wondo@houstonmethodist.org (W. Ondo).

Peer review under responsibility of Chinese Medical Association.

Production and Hosting by Elsevier on behalf of KeAi

http://dx.doi.org/10.1016/j.cdtm.2017.08.001

neurological deficits improved significantly 2 weeks later, but the symptoms of RLS did not resolve. Among them, 3/5 patients were treated with dopaminergic drugs. At the end of the follow-up, RLS symptom eventually resolved in 3 patients but persisted in two. The IRLS-RS, NIHSS and mRS scores were significantly lower at the onset than those at the last follow-up ($P = 0.035$, 0.024 and 0.049, respectively). However, there was no significant difference in the ERS, HDS and HAS scores ($P = 0.477$, 0.226 and 0.778, respectively).

Conclusion: RLS can be an onset manifestation of pontine infarction, clinicians should be aware of this potential symptom. RLS usually occurs in the paralyzed limbs contralateral to the infarction lesion. The pathogenesis still needs further investigation.

Keywords: Restless legs syndrome; Pontine infarction; Clinical features

Introduction

Restless legs syndrome (RLS) refers to an urge to move the leg that typically worsens at night and improves with movement. This disorder is reported with a prevalence varying from 4% to 29% in the general population, and approximately 70% of all RLS are primary idiopathic forms.[1] According to the literature, the causes of the remaining RLS include renal failure, depression, pregnancy, iron deficiency, migraine, Parkinson's disease, and stroke.[2–5]

Pontine infarction is a common type of stroke in the cerebral deep structures, resulting from occlusion of small penetrating arteries, may manifest as hemiparalysis, hemi-sensory deficit, ataxia, vertigo, and bulbar symptoms, but patients presenting with RLS are extremely rare. Herein, we reported five cases with restless legs syndrome as the main manifestation of pontine infarction.

Materials and methods

Patients

This study was approved by the Ethics Committee of Beijing Friendship Hospital. Five patients with a diagnosis of pontine infarction were enrolled from July 2013 till February 2016. The inclusion criteria included: (1) Magnetic resonance imaging (MRI) completed within 1 week after symptom onset; (2) acute infarction confirmed by diffusion-weighted imaging (DWI); and (3) the infarction was located in pons. The exclusion criteria included: (1) a previous ischemic stroke history; (2) acute infarction in other area of the brain; (3) patients with aphasia, cognitive impairment, or psychiatric diseases who cannot explain his/her symptom exactly; (4) incomplete clinical or radiological data; or (5) loss to follow-up.

The diagnosis of RLS was made according to criteria established by the International RLS Study Group (IRLSSG) in 2003.[6] The criteria include: (1) an urge to move the legs, which is usually accompanied by uncomfortable and unpleasant sensations in the legs; (2) the urge to move, and/or the unpleasant sensations, begin or worsen during rest or inactivity such as lying down or sitting; (3) the urge to move and/or unpleasant sensations are partially or completely relieved by movement, such as walking or stretching, at least as long as the activities are continued; and (4) the urge to move and/or unpleasant sensations are worse in the evening or night than during the daytime.

Informed consent was obtained from all individual participants.

Laboratory and radiological examinations

Physical and laboratory examinations included blood pressure, serum glucose level, hemoglobin, liver and kidney functions, thyroxine, electrolytes, and serum homocysteine. Electroencephalogram (EEG), lower-extremity somatosensory evoked potential (SEP), and nerve conduction velocity (NCV) in four limbs were performed, and the relevant results were collected. Brain MRI and DWI using a General Electric 3.0T double gradient magnetic resonance image were performed in all patients. The locations of ischemic infarction lesions were documented.

Clinical evaluation and follow-up

Neurological functions were assessed according to the National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS). Severity of RLS was based on the International RLS Rating Scale (IRLS-RS). Additionally, individual sleep quality was assessed by Epworth Rating Scale (ERS), and individual emotional and psychological states were assessed by Hamilton Depression Scale (HDS) and Hamilton Anxiety Scale (HAS). Follow-up data for all