Annals of Clinical Case Reports

Case Report
Published: 10 Dec, 2019

Misdiagnosis of an Atypical Creutzfeldt-Jakob Disease: Analysis of One Case in China and Review of the Literature

*Mengqi Zhanga[1], Zigao Wangb[2], Lijie Duana[1] and Hengbing Zua[1]**

[1]Department of Neurology, Jinshan Hospital, Fudan University, China

[2]Department of Neurology, Huashan Hospital, Fudan University, China

Abstract

Creutzfeldt-Jakob Disease (CJD) is a fatal and infectious disease, which usually has atypical clinical symptoms include rapidly progressive dementia, myoclonus, pyramidal/extrapyramidal, visual, and akinetic mutism. In this report, we present an atypical sporadic Creutzfeldt-Jakob disease patient who was first misdiagnosed as encephalitis or brucellosis. In clinical study, for atypical CJD, it is very important to increase diagnosis accuracy and decrease misdiagnosis of CJD.

Keywords: Creutzfeldt-Jakob disease; Prion protein; Dementia

Introduction

Creutzfeldt-Jakob Disease (CJD) is caused by misfolded prion protein (PrPsc), its typical clinical characteristic is progressive mental deterioration [1]. However, some cases can present atypically that lead to clinical misdiagnosis [2]. Some technical and laboratory examinations, such as EEG, MRI, laboratory tests (CSF 14-3-3 and RTQuIC), and prion protein gene (PRNP) sequencing, can help us make diagnosis more accurate [3]. Here, we report an atypical and sporadic CJD case and review some articles about CJD to help us better understand this rare disease.

Case Presentation

A sixty-three years old man who used to be a butcher presented to the emergency department with a two-month history of acute neurological disorders. At first, he was misdiagnosed as encephalitis or brucellosis during the first visit to the local hospital. After one month, the patient presented progressive walking unstable, myoclonus, gatism, anepia, eating disorder, and blindness had occurred in a short period. Then he was transferred to our department. When he arrived at our department, he was in akinetic mutism. Neurological examination revealed hypnody, anisocoria, paroxysmal tremor on double upper limbs, head and face, Babinski's sign was positive on the right side. Magnetic Resonance Imaging (MRI) revealed hyperintensity of the cortex and the caudate heads on both sides on diffusion-weighted imaging (Figure 1). Electroencephalography revealed triphasic slow waves. The test of 14-3-3 proteins in cerebrospinal fluid, which are known markers of prion disease, was positive. The polymorphic codon 129 of the prion protein gene (PRNP) is homozygous for Methionine (M/M) genotype. Given the patient's clinical characteristics and auxiliary examination results, he was diagnosed as sporadic CJD (sCJD). The patient died because of gastrointestinal tract hemorrhage nine weeks after the initial onset of symptoms.

Discussion

Prion disease is caused by the infectious proteins, misfolded forms of the prion protein (PrPsc). CJD is the most common human prion disease, it accounts for more than 90 percent of sporadic prion disease [1]. It exists in four forms: sporadic (sCJD), familial (fCJD), iatrogenic (iCJD) and variant CJD (vCJD) [2]. The typical clinical characteristics are progressive mental deterioration and myoclonus [3]. However, ten percent of cases may present atypically [4]. Some CJD patients may present with isolated neurological symptoms, or atypical neurological presentations, they can almost mimic all features of neurological disease, then leading to clinical misdiagnosis [5]. Here, we review some articles and conclude the mimicking diseases (Table 1). The PrPsc has transmissibility and can spread by cell-to-cell, tissue-to-tissue, host-to-host, and its main histology features are spongiform change, neuronal loss, and accumulation of the abnormal prion protein [6]. PrPsc can spread in several ways, such as the alimentary tract, the skin, and the nasal mucosa. Oral transmission and aerosol transmission have been reported [7,8]. The efficiency of intragastric infection is about 1/40,000 of

OPEN ACCESS

Correspondence:
Hengbing Zua, Department of Neurology, Jinshan Hospital, Fudan University, Shanghai, China, Tel: +86-21-34189990-5490; E-mail: hbzyy666@163.com

Received Date: *05 Nov 2019*
Accepted Date: *03 Dec 2019*
Published Date: *10 Dec 2019*

Citation:
Zhanga M, Wangb Z, Duana L, Zua H. Misdiagnosis of an Atypical Creutzfeldt-Jakob Disease: Analysis of One Case in China and Review of the Literature. Ann Clin Case Rep. 2019; 4: 1764.

ISSN: 2474-1655

Table 1: Creutzfeldt-Jakob disease mimicking diseases.

Case	Sex	Age	Common early clinical symptoms	Mimicking disease	MRI	EEG	Histology/ Biochemistry	Duration	Diagnosis
Hsiao PS, et al. [16]	M	83	Mild headache, behavioral changes, cognitive impairment, and irritability.	Focal epilepsy	Possible postictal changes	Seizure activity	CSF 14-3-3 protein (+)	3 m	sCJD
Miyake K, et al. [17]	F	82	Memory disturbance; unable to move her right hand well, right arm sometimes elevated involuntarily. Tonic convulsion	Status epilepticus	Ribbon-like high intensity	Showed spikes in the left parietal region, and slow wave bursts in the bilateral frontal areas	Diffuse cortical atrophy; typical spongiform changes; synaptic depositions of prion protein	3 y	sCJD
Ahn SW, et al. [18]	M	46	Lethargy, delusion of persecution, and auditory hallucinations depression and compulsive behavior	Schizophrenic	Cortical high signal intensities indicating a typical cortical "ribbon"	Periodic triphasic waveforms with background slowing	CSF 14-3-3 protein (+)	Sustained vegetative state; >2 y	sCJD
Sharma DK, et al. [4]	F	68	Left frontal headache; word-finding difficulties; Dyslexia, agraphia, constructional apraxia, and some perseveration.	Stroke	Unremarkable and consistent with age.	Normal	CSF 14-3-3 protein (+)	3 m	sCJD
Goosse K [19]	M	65	Progressive cognitive impairment, drunken man's gait and double vision.	Wernicke encephalopathy	Normal	Diffuse encephalopathic pattern with delta waves parietotemporally and sharpslow waves without triphasic complexes	Deposits of prion proteins CSF 14-3-3 protein (+)	2 m	sCJD
Dirzius E, et al. [20]	F	53	Blurred vision, dizziness, disturbed gait and coordination impairment	Posterior reversible encephalopathy syndrome	Normal	Normal	Prion protein scrapie (PrPSc) (+)	13 m	sCJD
Winton-Brown T, et al. [21]	M	61	Confusion, word-finding difficulties, slurred speech, and right-hand clumsiness	Catatonia	Cortical and basal ganglia hyperintensity	None	CSF 14-3-3 protein (+) spongiform encephalopathy, neuronal loss, and gliosis	4 w	sCJD
Zuhorn F, et al. [22]	F	75	Rapid progressive cognitive impairment.	Autoimmune encephalitis with CASPR2 antibodies	Multiple micro-angiopathic lesions	Generalized periodic pattern with triphasic waves	CSF 14-3-3 proteins (+); spongiform encephalopathy	unknown	sCJD
Yang HY, et al. [23]	M	57	Depression, early morning awakening, anhedonia and chronic back pain	Psychiatric disorders	Hyperintensities in the cerebral cortex and bilateral basal ganglia	Normal	CSF 14-3-3 protein (+)	unknown	sCJD

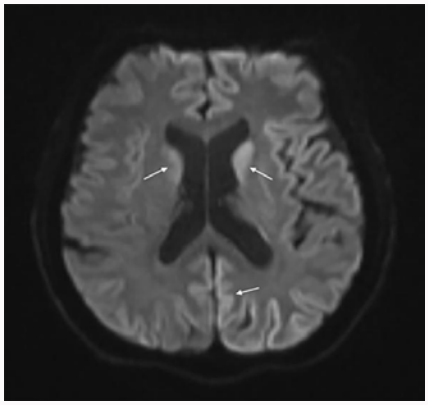

Figure 1: Diffusion-weighted Imaging. Hyperintensity of the cortex and the caudate heads on both sides (Arrows).

direct intracerebral infection [9]. Except the infection by inoculating with infected brain tissue [10], another study demonstrates that sCJD patients' skin contains one-hundred-thousandth to one-thousandth of prion seeding activity and can infect mouse by inoculating [11]. The approximate annual mortality is 1.6 per 1,000,000 and the mean age of onset is between 57 and 62 years [12]. There is no difference in morbidity between men and women [13].

Based on the data of China CJD surveillance network, this rare disease in China has been obviously underestimated [14]. Most Chinese sCJD patients often visit physician, psychiatrist or neurologist in local hospital at the early stage of disease, some atypical psychiatric and neurological symptoms and signs may be ignored in clinical diagnosis. Thus, differential diagnosis of sCJD remains challenging because of a huge overlap of clinical presentations [15]. Therefore, for possible CJD patients, CJD-associated technical/laboratory examinations, such as EEG, MRI, laboratory tests (CSF 14-3-3 and RT-QuIC), and PRNP sequencing, as much as possible are highly recommended in clinical diagnosis. In summary, in clinical work, it is very important that better recognition of sporadic CJD can help to increase diagnosis accuracy and decrease misdiagnosis of CJD.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant National and Institutional Committees on Human Experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Acknowledgment

This study was supported by grants from the Shanghai Municipal Commission of Health and Family Planning (Grant No. 201740209).

References

1. Puoti G, Bizzi A, Forloni G, Safar JG, Tagliavini F, Gambetti P. Sporadic human prion diseases: molecular insights and diagnosis. Lancet Neurol. 2012;11(7):618-28.
2. Masters CL, Harris JO, Gajdusek DC, Gibbs CJ, Bernoulli C, Asher DM. Creutzfeldt-Jakob disease: patterns of worldwide occurrence and the significance of familial and sporadic clustering. Ann Neurol. 1979;5(2):177-88.
3. Rabinovici GD, Wang PN, Levin J, Cook L, Pravdin M, Davis J, et al. First symptom in sporadic Creutzfeldt-Jakob disease. Neurology. 2006;66(2):286-7.
4. Sharma DK, Boggild M, van Heuven AW, White RP. Creutzfeldt-Jakob disease presenting as Stroke: A Case Report and Systematic Literature Review. Neurologist. 2017;22(2):48-53.
5. Baiardi S, Capellari S, Bartoletti Stella A, Parchi P. Unusual Clinical Presentations Challenging the Early Clinical Diagnosis of Creutzfeldt-Jakob Disease. J Alzheimers Dis. 2018;64(4):1051-65.
6. Kraus A, Groveman BR, Caughey B. Prions and the potential transmissibility of protein misfolding diseases. Annu Rev Microbiol. 2013;67:543-64.
7. Sigurdson CJ, Williams ES, Miller MW, Spraker TR, O'Rourke KI, Hoover EA. Oral transmission and early lymphoid tropism of chronic wasting disease PrPres in mule deer fawns (Odocoileus hemionus). J Gen Virol. 1999;80(Pt 10):2757-64.
8. Denkers ND, Hayes-Klug J, Anderson KR, Seelig DM, Haley NJ, Dahmes SJ, et al. Aerosol transmission of chronic wasting disease in white-tailed deer. J Virol. 2013;87(3):1890-2.
9. Kimberlin RH, Walker CA. Pathogenesis of scrapie in mice after intragastric infection. Virus Res. 1989;12(3):213-20.
10. Chandler RL. Encephalopathy in mice produced by inoculation with scrapie brain material. Lancet. 1961;1(7191):1378-9.
11. Orru CD, Yuan J, Appleby BS, Li B, Li Y, Winner D, et al. Prion seeding activity and infectivity in skin samples from patients with sporadic Creutzfeldt-Jakob disease. Sci Transl Med. 2017;9(417).
12. Ladogana A, Puopolo M, Croes EA, Budka H, Jarius C, Collins S, et al. Mortality from Creutzfeldt-Jakob disease and related disorders in Europe, Australia, and Canada. Neurology. 2005;64(9):1586-91.
13. Heinemann U, Krasnianski A, Meissner B, Varges D, Kallenberg K, Schulz-Schaeffer WJ, et al. Creutzfeldt-Jakob disease in Germany: a prospective 12-year surveillance. Brain. 2007;130(Pt 5):1350-9.
14. Qi Shi, Xiao K, Chen C, Zhou W, Gao C, Wang J, et al. Clinical and laboratory features of 14 young Chinese probable sCJD patients. Prion. 2017;11(2):128-35.
15. Geschwind MD, Murray K. Differential diagnosis with other rapid progressive dementias in human prion diseases. Handb Clin Neurol. 2018;153:371-97.
16. Hsiao PS, Lee YM, Chu FS, Lee CL, Liu FC, Tsai PH. Probable sporadic Creutzfeldt-Jakob disease mimicking focal epilepsy. Epilepsy Behav Case Rep. 2019;11:77-80.
17. Miyake K, Hara T, Oshima E, Kawada K, Ishizu H, Yamauchi Y, et al. Creutzfeldt-Jakob disease with Alzheimer pathology, presenting with status epilepticus following repeated partial seizures: a case report and literature review. Bmc Neurology. 2018;18(1):54.
18. Ahn SW, Park MS, Han SH, Yoon BN, Shin JY. Atypical sporadic Creutzfeldt-Jakob disease presenting as progressing schizophrenia. Neurol India. 2018;66(2):529-31.
19. Goossens K, van Bruchem-Visser RL. A patient with a 'typical presentation' of Wernicke encephalopathy was found to have sporadic Creutzfeldt-Jakob disease. Neth J Med. 2017;75(5):211-4.
20. Dirzius E, Balnyte R, Steibliene V, Gleizniene R, Gudinaviciene I, Radziunas A, et al. Sporadic Creutzfeldt-Jakob disease with unusual initial presentation as posterior reversible encephalopathy syndrome: a case report. BMC Neurol. 2016;16:234.
21. Winton-Brown T, Doti I, Ting A, Atherton S, Mocellin R, Loyal S, et al. A Case of Creutzfeldt-Jakob disease presenting as Catatonia. J Clin Psychiatry. 2016;77(7):e900-1.
22. Zuhorn F, Huebenthal A, Rogalewski A, Onugoren MD, Glatzel M, Bien CG, et al. Creutzfeldt-Jakob disease mimicking autoimmune encephalitis with CASPR2 antibodies. BMC Neurol. 2014;14:227.
23. Yang HY, Huang SS, Lin CC, Lan TH, Chan CH. Identification of a patient with sporadic CreutzfeldtJakob disease in a psychiatric ward. Psychiatry and Clin Neurosc. 2013;67(4):280-1.