JOURNAL OF MODERN NEUROLOGY
http://www.physi-med.com

CASE REPORT

Anterior Horn of Spinal Cord Lesion as a First Manifestation of a Multiple Myeloma (attached with a Case Report)

Feng Yu, Ding Hongmei, Wang Xiaolong, Dong Ruiguo, Geng Deqin

[1] *Neurology of the Affiliated Hospital of Xuzhou Medical University, Xuzhou, province of Jiangsu 221003*

ARTICLE INFO

Article history:
Received: 21 Sep, 2015
Revised: 5 Feb, 2016
Accepted: 14 Feb, 2016
Published online: 16 June, 2016

Keywords:
NMDA receptor ,ischemic stroke,NR2B, NR2A, Neuron protection,Neural excitotoxicity

ABSTRACT

Multiple myeoma (MM) is an abnormal growing of malignant plasma cell tumour that will invade many systems. It has a varied clinical manifestation, and a high probability of misdiagnosis. Here is a report of multiple myeloma with non-compressive spinal cord lesion as its first manifestation, with a retrospective analysis on pathogenesis, clinical manifestation, and diagnostic basis of MM. With the clinical characteristics and diagnostic criteria of MM in the documents, exploration and discussion is made to improve the alertness of clinicians to MM, and to reduce misdiagnosis.

Medical record

70 years old male patient, the admission reason was feeling weak in left upper limb for 2 months, and suffering from muscle atrophy in four limbs for 2 weeks. The patient's left upper limb felt weak and tingling 2 months before without clear origin, he was having difficulty in elevation, and unstable holding. He was treated as cerebral infarction in the local hospital, yet no improvement in his condition. 1 month ago, the patient's left hand was suffering from thenar atrophy, he felt weak in his lower limbs and needed great effort to go upstairs. Cervical MRI scan Result: cervical degenerative changes, intervertebral disc bulges at C3-4, C4-5 and C5-6, and had compression on frontal edge of dural sac and left neural root. He was then diagnosed with cervical spondylosis and was given treat ment in the local hospital, and yet no improvement in his condition. 2 weeks ago, he felt weaker in his four limbs and the muscle of his limbs started to atrophy. Then, he came to our hospital for a further diagnosis. Admission body check: Muscle strength of the patient's left upper limb rated on a scale of 4, muscle strength of other limbs rated on a scale of 5. His reflex of left upper limb was weakening, but the other limbs were normal; his left thenar muscle and all four limbs' muscle were atrophying, but the other body check result was normal. Admission laboratory examination: leukocytes count was 11.4 × 109/L, erythro cytes count was 2.67 × 1012/L, hemoglobin was 86g/L, total protein was 131.5g/L, serum creatinine was

First author: Feng Yu, Neurology of the Affiliated Hospital of Xuzhou Medical University, Xuzhou, province of Jiangsu 221003

113μ mol/L, serum calcium was normal. Blood image: the total amount of leukocytes increased, erythrocytes are forming rouleaux, thrombocytes increased. Consultation of hematology: immunofixation electrophoresis (IFE): IgG (+), K(+), serum protein electrophoresis (SPEP) albumin: 23.9%, alpha: 5.8%, gamma: 63.2%, M-protein positive, immunoglobulin (A, G, M) + serum chain examination: IgG 92g/L, IgA 0.2g/L, IgM 0.86g/L, immunoglobulin K light-chain: 147 g/L, urinary light-chain examination: immunoglobulin K light-chain: 4460.0 ug/L, bone marrow aspiration: plasma cells 30%, a clear and definite diagnosis as multiple myeloma (MM, IgG type), and immediately transferred to hematology on the same day for BD chemotherapy. The weak feeling of limbs and symptom of muscle atrophy had relieved, and the patient asked to be discharged from hospital. While the therapy was in progress, our department tracked the electromyography, and found denervation potentials and fasciculation potentials in muscles of four limbs, insertion potentials was extended with appearance of giant potentials with synchronisation rate at 90%, an extended latency period for F-wave upper limb nerve inspection, and low in extraction rate. Prompting a pathological change in anterior horn of spinal cord. Chest CT, skull PA & LAT views, and right femoral scanning: no abnormality.

Discussion

An Abnormal proliferation of plasma cells on MM causes malignant neoplasm which takes up 10% of haematological malignancies. It is more often to be found on the elders. It has a hidden seizure, a variety of clinical manifes tation, but lack of specificity. The invasion of myeloma cells is mostly limited to bone marrow and bone among MM patients, it would clinical presents as osteolytic lesion or osteoporosis, hypercalcemia, and anemia [1]. Myeloma cells are also able to breakthrough bone cortex for either direct invasion or spreading by bloodborne metastasis to extramedullary, into soft tissue and neural system, and bring different kinds of neurological symptoms. There is a big part of patients have extramedullary invasion as clini cal manifestation during first diagnosis [2], therefore the clinical manifestation of MM patients is lack of specificity, and will easily cause misdiagnosis. A report has stated misdiagnosis of MM during first diagnosis is up to 56.44%; the most common misdiagnosis is osteoarthrosis, it is up to 32.2% of misdiagnosis, and 2.97% is misdi ag nosed as neurological disease [3]. This case has muscle at rophy in four limbs that cause by non-compressive spinal cord lesion as first manifestation, along with anemia, in fection, and renal dysfunction, is extremely rare in clinical cases.

Neural pathogenesis of lesion in MM and its clinical manifestation: 1. Spinal cord lesions: can be categorised as compressive or non-compressive spinal cord lesion. (1) The frequency of compressive spinal cord lesion is around 20% [2]. It usually attacks thorax, and then proliferates while MM are spreading from spine to spinal canal, creates compression by surrounding dura mater, and usually with spinal collapse. The first presentation is commonly a lower back pain, and then changes to numbness in limbs and torso, feeling abnormal, paraplegia, and sphincter dysfunction. The X-ray result usually shows osteoporosis, or compressive fracture, and sometimes soap bubble-like expansion or paraspinal shadow. (2) non-compressive spinal cord lesion[4]: Extremely rare, might show as non-specific pathological change of spinal cord, anterior horn of spinal cord degeneration, ascending myelopathy, etc. If it has invaded spinal vascular, it might cause myelomalacia. X-ray films of the patients from these cases did not show osteoporosis and compression. The electromyography shows anterior horn of spinal cord lesion, and the clinical manifestations are feeling week in four limbs and muscle atrophy. After BD chemotherapy, the symptoms have relieved, and correspondent with non-compressive spinal cord lesion of MM. 2. Myeloma-like meningitis: causes by spreading of plasma cells into pia mater, commonly seen in IgA and IgM type of MM, and usually comes along with meningeal stimulation symptoms, such as headache, nausea, vomit. 45% of the patients is able to find plasma cells in their blood circulation, 90% of the patients can found immature plasma cells in their CSF, prognosis is very poor [5]. 3. Pathological change of peripheral nerve may cause plasma cells increase abnormally, M-protein integrate into myelin of peripheral nerve, especially integrating into glycoprotein that is relevant to myelin; meanwhile, M-protein is probably deposit in the separated part of myelin and causes secondary demyelination [6], manifests as dyskinesia with muscle atrophy by acute or chronic progressive limbs, vanishing of tendon reflex. The mechanism and manifestation of POEMS syndrome: 4. Cranial nerve lesion: mostly causes by nerve compression of plasmacytoma that formed in the brain of MM patients. Its clinical manifestations are focal symptoms, such as hemiparesis, hemidysesthesia, hemianopsia, aphasia, etc. The compression of cranial nerve is mostly involved by IV, and follows by VI, VII, VIII, IX.

Prevention for misdiagnosis in MM: MM has a variety of clinical manifestations and is lack of specificity, this brings a high rate of misdiagnosis in first diagnosis, and is more difficult to diagnose if its first manifestation is in neural system. As a clinician, especially a non-hematologi cal clinician, it is important to improve an integrated un-

derstanding on MM, to change the stylised thinking on di agnosis in order to improve the first diagnosis rate of MM, so as to avoid from misdiagnosis, to improve the quality of patients' life, and the key point of prognosis. For the doc tors of neurology, a detailed enquiry about the patient's medical history and a thorough body check are necessary to all elder patients of nerve lesion with unknown reason, and along with the following conditions: 1. Unknown bone pain, osteoporosis, and pathological fracture. 2. Unknown anemia, hemorrhage, an increasing erythrocyte sedimenta tion rate, and hypercalcemia. 3. Unknown edema, protein uria, and kidney lesion. 4. Unknown abnormal liver func tion, and abnormal immunoglobulin. Diagnosis shall be done without letting any diagnostic trail off, in addition to get on blood film, hematuria immunoglobulin elec trophoresis, skeletal x-ray, and bone marrow cytology ex aminations, in order to confirm and proceed to an early di-agnosis for MM, which is also enhancing prognosis.

References

1. Internatio nal Myeloma Working Group Criteria for the classification of monoclonal gammopathies, multiple myeloma and related disorders: a report of the International Myeloma Working Group 2003 (05)

2. Bladé J; Lust JA; Kyle RA Immunoglobulin D multi ple myeloma: presenting features, response to therapy and survival in a series of 53 cases 1994 (11).

3. Zhou Jingyong, Tang Hua, Wang Juan. Meta-analysis of misdiagnosis in multiple myeloma, leukemia . myeloma (J) 2013, 22(8).

4. Jiang Yuping, Wang Jian, Jiang Wenwei. New neu rological disease studies (M), Shanghai Popular Science Press: 246.

5. Zuo Xuelan, Huang Jianying, Zeng Xianchang. Neuropathy as the first manifestation of multiple myeloma, Journal of Brain and Nervous Diseases (J) 2002, 10(6).

6. Sun Hanying, Guo Xiaoping. An analysis of 46 blood disease cases with nervous system damage as first manifestation. Journal of Internal Intensive Medicine, 1999, 5(1): 12-13.