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Case Report Multiple Sclerosis

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Abstr act

BACKGROUND: Multiple sclerosis (MS) is an autoimmune disease in the form of chronic inflammation of the CNS. This disease is mediated by autoreactive lymphocytes that can cross the blood-brain barrier and thus enter the CNS and cause inflammation. Chronic demyelinating CNS lesions characterize multiple sclerosis, and immunity to myelin is involved. This disease predominantly attacks the brain, spinal cord, and optic nerve. The diagnosis of MS is made clinically, and there is no single definitive test for MS. The key to diagnosis is Dissemination in Space (DIS) and Dissemination in Time (DIT). Magnetic resonance imaging has become an essential part of the diagnosis of MS after clinical.

CASE REPORT: Here, we report a case of a 31 year-old woman with the main complaint of weakness of four extremities accompanied by a decreased vision and impaired urination and bowel movement. The patient was diagnosed with suspected MS.

CONCLUSION: The patient subsequently was treated with intravenous steroids and, on the routine follow-up found marked clinical improvement.

Introduction

Multiple sclerosis (MS) is an autoimmune disease in chronic inflammation of the central nervous system (CNS) [1], [2], [3], [4], [5], [6], [7], [8]. Multiple sclerosis was first recognized as a disease in the late 19th century. In 1960, researchers began to understand some disease processes that can cause long-term symptoms and disability [3]. Multiple sclerosis is characterized by chronic demyelinating CNS lesions and immunity to myelin is involved. This disease predominantly attacks the brain, spinal cord, and optic nerve [4]. Globally, the prevalence of MS is 30 per 100,000 people [5], [9]. The prevalence of MS in Indonesia ranges from 1 to 5/100,000.

Population [2] MS is more common in women than in men with a ratio of 2:1 [3], [8], [10], [11], [12], [13]. Usually, diagnosis occurs between 20 and 45 years of age.

The etiology of MS is still unknown, but several factors are thought to play an important role. Autoimmune, genetic, and environmental factors are several essential factors in the development of MS [9]. MS patients exhibit a wide variety of neurologic manifestations originating in various areas of the CNS [10]. Initial symptoms may be singular or in combination with other symptoms [1], [10]. The course of MS disease can be divided into several subtypes, namely, Relapsing-Remitting MS (RRMS), Secondary Progressive MS (SPMS), Primary-Progressive MS (PPMS), and Progressive Relapsing MS (PRMS). The diagnosis of MS is made clinically, and there is no single definitive examination for MS [2], [14]. Diagnosis requires a neurological examination and clinical observation over a period of time [1].

The key to establishing a diagnosis is the presence of Dissemination in Space (DIS) and Dissemination in Time (DIT) [4], [7], [15], [16]. Magnetic Resonance Imaging (MRI) is a very important part of establishing the diagnosis of MS after clinical examination [1], [17]. Magnetic Resonance Imaging can identify scar tissue formation and damage to the CNS [18]. Magnetic Resonance Imaging has been considered an essential non-clinical tool in early detection of MS, where MRI can help determine the criteria for DIT and DIS [14]. To date, no therapy has been found to cure or treat preventing MS [7], [12]. Current therapeutic strategies aim to reduce the risk for relapse and the potential progression to disability [12].

Case Report

A woman, 32 years old, came with complaints of weakness in all four limbs. This complaint began

to be felt ± 1 month before being admitted to the hospital, gradually getting worse and worse. Initially numbness in both legs, then weakness in both legs and accompanied by weakness in both arms. She also reported on difficulty urinating and defecating in this 1 month. Blurred vision was also experienced in this 1 month which was felt heavier in the right eye. There was no history of fever, cough, flu, and shortness of breath. There was no history of head trauma, sitting down and impact around the back. The patient was taken to a regional hospital and then referred to the Haji Adam Malik Hospital in Medan.

In the previous medical history, complaints like this had been experienced before by the patient, which was about 20 years ago with complaints of weakness in all four limbs accompanied by visual disturbances that lasted ± 1 month, without receiving therapy but having experienced perfect improvement and ability to move as usual. Then about 4 years ago, the same complaint appeared when the patient was pregnant, with weakness of all four limbs accompanied by visual disturbances which also lasted ± 1 month was reported, without receiving therapy and experiencing complete improvement.

Physical examination revealed compos mentis consciousness with blood pressure 120/80 mmHg, heart rate 88 times/minute, respiratory rate 20 times/minute, and temperature 36.3 C. Conjunctiva not anemic, sclera not icteric, an isochoric pupil with diameter 3 mm/3 mm, light reflex +/+. The thoracic inspection was within normal limits, with no rhonchi and wheezing — normal heart rhythm. Abdominal examination showed no distension, the liver and spleen were not palpable. Examination of the extremities was found to be warm and perfused well.

On neurological examination found a weakness in all four limbs accompanied by increased physiological reflexes in both legs. Visual examination found visual acuity in the right and left oculi that are 1/300. On autonomic examination, we found urinary and fecal retention. No sensory disturbances were found.

Blood laboratory examination, chest x-ray, thoracic and lumbar x-rays were within normal limits. The patient was diagnosed with UMN Tetraparesis + Urinary and fecal retention + Blurred Vision et cause Susp multiple sclerosis. The patient was placed on a catheter and given Inj therapy. Methylprednisolone 125 mg/6 h, Inj. Ranitidine 50 mg/12 h, Vitamin B, and Complex 3 × 1 tablet. The patient was planned for a Whole Spine MRI and Brain MRI with contrast. In Whole Spine MRI examination with contrast, straight thoracolumbar vertebrae, degenerative disk disease involving L3-4, L4-5, L5-S1 disks and degenerative marrow disease in Th8 vertebral bodies, spinal cord sclerosis, and DD/: C7-high edema -Th1 to Th2-3 were found (Figure 1). On MRI brain examination with contrast, we found a picture of Susp. Multiple sclerosis, DD/: Infection with right temporal-parietal lobe atrophy (Figure 2).

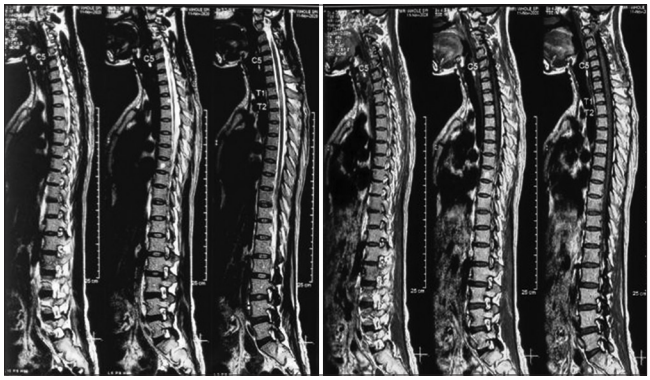

Figure 1: MRI Whole Spine with IV contrast. A round hyperintense lesion is seen on the Th8 vertebral body

Therapy was continued according to relapse therapy in cases of multiple sclerosis. After receiving therapy, the patient showed improvement. Observations made during treatment, on the 3rd day, there was an improvement in motor strength in both legs. On the 6th day, there was an improvement in visual acuity in the left eye. The patient was subsequently treated as an outpatient with a gradual decrease in the dose of oral methylprednisolone, and the patient was advised to return to the neurology polyclinic for follow-up.

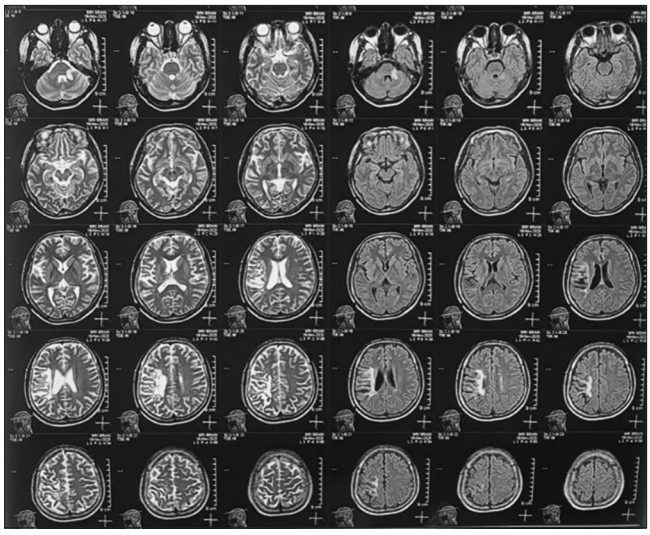

Figure 2: Hyperintense lesions were seen in the left cerebellar hemisphere and right frontotemporoparietal lobe to the right periventricular with a cortical widening of the right temporoparietal lobe sulcus

Discussion

Multiple sclerosis is an immune complex-mediated disease characterized by repeated episodes of demyelination in the central nervous system, which generally occurs in patients in the young adult age group [19].

In this case report, the authors present a case report of multiple sclerosis in a 32-year-old woman who

was treated at H. Adam Malik Hospital, Medan. The diagnosis of multiple sclerosis in this patient was made based on several clinical manifestations supported by an MRI examination. Establishing this diagnosis is in accordance with the previous theory that there is no single specific examination to diagnose MS. The diagnosis of MS is based on clinical manifestations and the results of investigations. MRI examination is one of the supporting examination modalities that can be used to diagnose MS, where this examination can help determine the criteria for DIT and DIS [9], [14].

The patient's complaint at the time of admission to the hospital was weakness in the four limbs, which began to be felt after ± 1 month before admission to the hospital, gradually getting worse and worse — initially numbness in the left leg followed by weakness in both legs. The patient also said it was difficult to urinate and defecate in this one month. Blurred vision has also been found for 1 month. Complaints like this have been experienced before by patients about 20 years ago with complaints of weakness in the left limbs and face and accompanied by visual disturbances but have experienced complete improvement. Then about 4 years ago, the same complaints appeared, left limb weakness accompanied by visual disturbances with complete improvement from this episode.

Early signs and symptoms of MS may include weakness or numbness, sometimes both, in one or more extremities. Symptoms generally appear within hours or days. Early symptoms of MS can be a single symptom or a combination of other symptoms. Symptoms appear with a subacute onset within days to weeks. MS manifestations vary widely. Typical symptoms are fatigue, depression, cognitive dysfunction, spasticity, pain, bowel and bladder disturbances, erectile dysfunction, and visual disturbances. Bladder dysfunction in MS depends on the extent of spinal cord involvement; estimates of bladder dysfunction vary depending on the severity of the disability.

The patient has performed several MRI examinations, including a Whole Spine MRI with contrast showing straight thoracolumbar vertebrae, degenerative disk disease involving L3-4, L4-5, L5-S1 disks and degenerative marrow disease in Th8 vertebral bodies, spinal cord sclerosis.

DD/: Edema as high as C7-Th1 to Th2-3. On MRI Brain examination with contrast found a picture of Susp. Multiple sclerosis, DD/: Infection with right temporal-parietal lobe atrophy.

The MRI criteria for MS are based on the presence of focal white matter (WM) lesions in the CNS, which is a common consideration for MS conditions in distribution, morphology, evolution, and abnormalities in conventional MRI sequences (such as T2-weighted, T2 FLAIR, and T1-weighted) before and after contrast. Several modifications of the diagnostic criteria have been introduced over the years [16].

The patient's brain MRI showed hyperintense lesions in the right periventricular and left infratentorial areas. And on the Whole Spine MRI examination with contrast, degenerative disk disease was found involving L3-4, L4-5, L5-S1 discs and degenerative marrow disease in Th8 vertebral bodies, spinal cord sclerosis, DD/: Edema as high as C7-Th1 to Th2-3. In accordance with McDonald's criteria of Disseminated Lesion in Space (DIS), which is seen on T2 sections in at least 2 of 4 areas: Periventricular, juxtacortical, infratentorial, and spinal cord [2].

Based on McDonald's criteria, dissemination in time (DIT) can be enforced if:

1. Presence of other asymptomatic lesions that intensify or do not contrast with gadolinium administration at any time, or
2. New or contrast-enhanced T2 lesions on MRI performed at follow-up, regardless of the time of the previous MRI.

In this case, one additional examination is needed to enforce DIT. However, based on the clinical manifestations encountered by the patient, namely, the presence of 2 attacks and the fulfillment of the DIS criteria on the MRI image, it is very likely that this patient's diagnosis leads to MS.

The patient was differentially diagnosed with Neuromyelitis Optica (NMO). Distinguishing MS and NMO is very important. These two diseases have some similar and overlapping symptoms. Optic neuritis attacks in NMO are generally more severe than in MS. Bilateral optic neuritis or more rapidly developing optic neuritis (NO) is typical in NMO. Similarly, the picture of papilledema and papillae atrophy. The retinal layer in NMO is also thinner than in MS. Magnetic resonance imaging examination of the spinal cord at NMO showed a lesion that extended to more than three vertebral segments [2].

The patient was also differentially diagnosed with Acute Disseminated Encephalomyelitis (ADEM). Acute disseminated encephalomyelitis is another demyelinating disease that distinguishes it from MS and NMO. The notable difference between ADEM and MS is in the monophasic course of the disease. Acute disseminated encephalomyelitis disease is accompanied by encephalopathy or coma with multifocal symptoms such as cerebellar symptoms, motor disturbances, sensory disturbances, optic neuritis, or myelitis. In general, ADEM is preceded by an infectious or post-vaccination episode. On MRI, symmetrical multifocal lesions or diffuse brain lesions are seen [2].

The patient received therapy according to relapse therapy in cases of multiple sclerosis. After receiving therapy, the patient showed an improvement in motor strength in both legs and an improvement in vision in the left eye. Until now, no therapy has been found to cure or prevent MS. Current therapeutic strategies aim

to reduce the risk for relapse and potential progression to disability. There is some scientific evidence showing the effectiveness of glucocorticoids in the treatment of relapse. Corticosteroids are considered the mainstay of treatment for acute exacerbations. Intravenous (IV) or oral methylprednisolone at a dose of 500 mg daily for 3–5 days should be considered in the treatment of relapse therapy [2], [7], [12], [20], [21].

Conclusion

Multiple sclerosis is an autoimmune disease in the form of chronic inflammation of the CNS. This disease is mediated by autoreactive lymphocytes and can penetrate the blood-brain barrier, enter the CNS, and cause inflammation. The diagnosis of MS is clinically made without any single definitive test for MS. The key to establishing the diagnosis is the presence of DIS and DIT. Magnetic resonance imaging becomes a very important part of the diagnosis of MS after clinical. Until now, no therapy has been found to cure or prevent MS.

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