Journal of Experimental and Clinical Medicine
http://dergipark.ulakbim.gov.tr/omujecm

Case Report

J. Exp. Clin. Med., 2015; 32(1): 39-41
doi: 10.5835/jecm.omu.32.01.008

A case of neurobrucellosis

Aslı Akin[a*], Feyza Demiralin[a], Rıfat Reha Bilgin[a], Selma Tosun[b], Gülşen Mermut[b], Muhteşem Gedizlioğlu[a]

[a] *Deparment of Neurology, İzmir Bozyaka Training and Research Hospital, İzmir, Turkey*
[b] *Deparment of Infectious Diseases, İzmir Bozyaka Training and Research Hospital, İzmir, Turkey*

ARTICLE INFO

Article History
Received 12 / 10 / 2013
Accepted 08 / 06 / 2014

*** Correspondence to:**
Aslı Akin
Deparment of Neurology,
İzmir Bozyaka Training and Research Hospital,
İzmir, Turkey
e-mail: asli_akin85@hotmail.com

Keywords:
Brucellosis
Central nervous system
Neurobrucellosis
Peripheral nervous system
Treatment

ABSTRACT

Brucellosis is a multisystemic disease that may present with a broad spectrum of clinical manifestations and complications. Neurological symptoms are common in brucellosis. Neurobrucellosis associated with central nervous system involvement is a rare clinical form of disease, (1.7-7% of prevalence). A 50-year-old man presented with confusion, bilateral vestibulocochlear nerve paralysis, symptoms of cerebellar dysfunction, atrophy and paralysis of multiple muscles. Involvement of both central and peripheral nervous system as well as the production of *Brucella melitensis* in the cerebro-spinal fluid culture was thought to be eligible for presentation. In laboratory tests; Rose-Bengal test in blood serum was positive; brucella tube agglutination test was 1/160 positive and Brucella melitensis was reproduced in cerebro-spinal fluid culture. He was treated with rifampicin (600 mg/day), doxycycline (200 mg/day) and ceftriaxone (2000 mg/day) combination. After one month, the patient was hospitalized for a second time as symptoms and findings of prior clinical picture were again detected. Rose-Bengal in blood serum, Brucella tube agglutination (1/160 titration) and Brucella tube agglutination with coombs (1/160 titration) tests were positive. In conclusion; in a case of subacute progressive neurobrucellosis, successful results may be attained by application of a proper antibacterial combination in a sufficient dose and for a sufficient time period.

1. Introduction

Brucellosis is an infectious disease which is caused by brucella bacteria and transmitted to humans from animals. It is a multisystemic disease which occur with involvement of cardiovascular, hematopoietic, skeletal, neurologic, cutaneous and gastrointestinal system (Özdemir et al., 2003; Yetkin et al., 2006; Pelit et al., 2009; Ceran et al., 2011). Brucella bacteria can pass from animals to humans through the skin or inhalation, but the main route of transmission is through the consumption of contaminated milk and milk products. There is a neurologic involvement in 1.7-7% of all brucellosis cases (Shakir et al., 1987; Al-Sous et al., 2004; Yetkin et al., 2006; Demiroğlu et al., 2011; Okuyucu et al., 2011).

In the case presented; the presence of confusion, bilateral involvement of 8th cranial nerve, cerebellar findings, atrophy, and weakness in various muscle groups were detected. *Brucella melitensis* reproduction was observed in cerebro-spinal fluid (CSF) culture, in addition to involvement of both central and peripheral nervous system together.

2. Case presentation

50 year-old male patient was referred to Izmir Bozyaka Training and Research Hospital, Neurology Clinic with complaints of hearing loss, being unable to walk, imbalance, weakness, weight loss, speech disorder and drowsiness. We learned that his complaints had started three months ago; he lost weight and became weak; and in time he had difficulty in walking and diminished hearing. It was conveyed that, the patient, whose speech became recently incomprehensible, was generally drowsy. The patient, who was an animal breeder and consumed dairy products of his own, was having medical treatment for hypothyroidosis. No peculiarities in anamnesis.

Systemic examinations were normal. It was hard to cooperate with the drowsy patient during neurological examination, in which bilateral advanced hearing loss was

detected. His speech was nasal and dysarthric. The patient, who was having hard time to hold his head; stood with support, walked with difficulty and was unable to stand up without support. Both his temporal and masseter muscles, neck flexor and extensors, proximal and distal muscles of upper and lower extremities were atrophic and weak. Deep tendon reflexes were hypoactive in upper extremities; while none were available in lower extremities. Plantar response was bilateral flexor. Sensorial examination couldn't be done due to lack of communication. Dysmetria and dysdiadochokinesia were detected, prominent on the left side. There was no proof of neck rigidity and meningeal irritation. Bilateral pes cavus deformity was present.

In laboratory tests; hemogram, sedimentation values and results of biochemical tests were within normal ranges. Rose-Bengal test in blood serum was positive; brucella tube agglutination test with coombs was 1/160 positive. In CSF, the mononuclear cell count 300 cell/mm^3 mononuclear cells (98% lymphocyte), protein was 92.6 mg/dL, glucose was 18 mg/dL (simultaneous blood glucose was 72 mg/dL). Rose-Bengal test in CSF was positive, Brucella tube agglutination was positive in 1/160 titration. *Brucella melitensis* was reproduced in CSF culture, while no reproduction was observed in blood culture. In electroencephalography (EEG), it was observed that basic waveforms were consisted of slow-waves in teta frequency extensively. Audiometry findings indicated bilateral total sensorineural hearing loss. In electromyography (EMG), demyelinating and axonal type polyneuropathy findings were detected, in which initially motor fibres were involved. Mega sisterna magna image was revealed in cranial magnetic resonance imaging.

Based on examination findings and laboratory test results, the patient's treatment was started with diagnosis of neurobrocellosis. In this treatment, rifampicin (600 mg/day), doxycycline (200 mg/day) and ceftriaxone (2000 mg/day) combination was applied. After a one-month parenteral treatment, the patient, whose complaints and examination findings partially got better; was discharged with recommendation of oral trimethoprim-sulfamethoxazole. After a month, the patient was hospitalized for the second time as symptoms and findings of prior clinical picture were again detected. Rose-Bengal in blood serum, Brucella tube agglutination (1/160 titration) and Brucella tube agglutination with Coombs (1/160 titration) tests were positive.

In CSF, the mononuclear cell count was 180 cell/mm^3, protein was 288.6 mg/dL, glucose was 33 mg/dL (simultaneous blood glucose was 79 mg/dL). In CSF, Rose-Bengal and Brucella tube agglutination (1/80 titration) tests were positive. With these findings, the patient was treated for two months with rifampicin (600 mg/day), doxycycline (400 mg/day), ceftriaxone (4000 mg/day) and methylprednisolone (1000 mg/day). At the end of that period, he could communicate aloud, his speech was intelligible and he was able to walk without support. In blood serum and CSF test, all Brucella indicators were negative. No cells were detected in CSF, protein and glucose values were within normal ranges. There was no reproduction in blood and CSF culture. As a result of mutual evaluation with infectious diseases clinic, the treatment was ended and patient was discharged.

3. Discussion

Cases of neurobrucellosis may be evaluated in two groups as acute and chronic progressive, regarding their clinic characteristics. The cases that start as acute and in which changes in consciousness and findings of meningitis are prominent, may also be defined as meningoencephalitis group (Shakir et al., 1987; Sengöz et al., 2010; Demiroğlu et al., 2011). In chronic progressive group, there are cases with polyradiculoneuropathy and diffuse central neural system involvement (Shakir et al., 1987; Demiroğlu et al., 2011). Considering patient's complaints in the beginning and examination findings, it can be said that along with eighth cranial nerves, primarily, peripheric nerves are also extensively involved.

The drowsy state, emerging later and slowing down of basic waveforms observed in EEG, make us consider that central nervous system is affected. CSF findings are consistent with existence of a subacute (or chronic) progressive meningoencephalitis case. This clinical picture emerges as a direct emission of Brucella bacteria to central nervous system (CNS) or autoimmunity caused by toxins (Shakir et al., 1987; Özdemir et al., 2003; Ceran et al., 2011; Demiroğlu et al., 2011). An extensively spread cerebellar (paranchymal) contagion may be explained with meningovascular involvement in the patient, in whom dysmetria and dysdiadochokinesia are detected, as well as proof of distinctive ataxia. In such a situation, it is hard to evaluate the patient in any of the groups of acute or chronic progressive cases. The case has a subacute progressive course and resulted with widespread involvement of both peripheral and central nervous system. Isolation of *Brucella melitensis* and reproduction in CSF culture provided certainty of diagnosis. It is only possible for less than 20% of the patients to isolate the bacteria and to reproduce it in the culture (Özdemir et al., 2003; Pelit et al., 2009; Ceran et al., 2011)

The patient was treated with rifampicin, doxycycline and ceftriaxone combination, in accordance with the recommendations of classical treatment. After one-month application of triple-drug combination, pursuing the treatment with oral route trimethoprim-sulfamethoxazole resulted with the relapse of clinical picture. The second phase of the treatment continued for two months, clinical picture recovered and bacteriologic indicators were negative. Necessity of a continuous treatment and methylprednisolone application in this period are also emphasized in the literature (Shakir et al., 1987; Bilgin et al., 1994; Karaca et al., 2001; Özdemir et al., 2003; Demiroğlu et al., 2011). To get an adequate clinical response in the treatment of brucellosis, treatment should be continued for at least 45 days and could be extended to two or three months if necessary. In our case, completing 45 days of treatment resulted in clinical nonresponse.

In present case report, we emphasite that central and peripheral systems are affected together. *Brucella melitensis* may be reproduced in CSF; in a case of subacute progressive neurobrucellosis, successful results may be attained by application of a proper antibacterial combination in a sufficient dose and for a sufficient time period.

REFERENCES

Al-Sous, M.W., Bohlega, S., Al-Kawi, M.Z., Al, Watban, J., McLean, D.R., 2004. Neurobrucellosis: Clinical and neuroimaging correlation. Am. J. Neuroradiol. 25, 395-401.

Bilgin, R.R., Özes, İ., Gedizlioğlu, M., 1994. Nörobruselloz: Bir olgu nedeni ile önemli bir ayırıcı tanı seçeneğinin anımsanması. Nöropsikiyatri Arşivi. 31, 66-73.

Ceran, N., Turkoglu, R., Erdem, İ., İnan, A., Engin, D., Tireli, H., Göktaş, P., 2011. Neurobrucellosis: Clinical, diagnostic, therapeutic features and outcome. Unusual clinical presentations in an endemic region. Braz. J. Infect. Dis. 15, 52-59. doi: 10.1590/S1413-86702011000100010.

Demiroğlu, Y.Z., Turun, T., Karaca, S., Arlıer, Z., Alışkan, H., Çolakoğlu, Ş., Arslan, H., 2011. Brusellozda sinir sistemi tutulumu; klinik sınıflama, tedavi ve sonuçlar. Mikrobiyol. Bul. 45, 401-410.

Karaca, S., Selçuki, D., Mavioğlu, H., Dönmez, H., 2001. Nörobruselloz: Olgu Sunumu. Ankara Üniversitesi Tıp Fakültesi Mecmuası. 54, 381-386.

Okuyucu, A.A., Yılmazer, S., Dede, H.Ö., Melek, İ., Duman, T., 2011. Bir nörobruselloz olgusu. Türk Serebrovasküler Hastalıklar Dergisi. 17, 73-76.

Özdemir, D., Albayrak, F., Cesur, S., Gönenli, B., Sözen, T.H., Tekeli, E., 2003. Bir nörobruselloz olgusu. İnfeksiyon dergisi. 17, 499-500.

Pelit, M., Ergüven, M., Laloğlu, F., Çetiner, N., Arıyaylalıoğlu, S., 2009. Papillit ile seyreden nörobruselloz olgusu. İstanbul Tıp Fakültesi Dergisi. 72, 61-64.

Sengoz, A.I., Ceran, N., Erdem, İ., Engin, D., Senbayrak, S., Ozyurek, S.C., Goktas, P., 2010. Neurobrucellosis with transient ischemic attack, vasculopathic changes, intracerebral granulomas and basal ganglia infarction: A case report. J. Med. Case Reports. 4, 340. doi: 10.1186/1752-1947-4-340.

Shakir, R.A., Al-Din, A.S., Araj, G.F., Lulu, A.R., Mousa, A.R., Saadah, M.A., 1987. Clinical categories of neurobrucellosis. A report on 19 cases. Brain. 110, 13-223. doi: 10.1093/brain/110.1.213.

Yetkin, M.A., Bulut, C., Erdinc, F.Ş., Oral, B., Tulek, N., 2006. Evaluation of the clinical presentations in neurobrucellosis. Int. J. Infect. Dis. 10, 446–452. doi:10.1016/j.ijid.2006.05.007.