Rheumatoid meningitis

Central nervous system involvement in rheumatoid arthritis (RA) is a rare and treatable, yet potentially fatal, condition that is frequently recognized only by autopsy [1].

Till 2018 approximately 25 case reports were published describing various clinical symptoms of this condition, including confusion, focal neurological deficits, seizures, stroke-like episodes, and Parkinsonism [2].

Rheumatoid meningitis (RM) is a rare complication of rheumatoid arthritis (RA) and has a high mortality rate. It can present as a first diagnosis of RA, in long-standing disease, or in active or well-controlled disease. Neurological manifestations vary widely.

RM must be considered in adult patients with or without RA diagnosis [3].

Epidemiology

RM affected adults with an average age of 62 years, with or without a previous diagnosis [4].

Clinical features

The most common clinical manifestations were transient focal neurological signs (64.6%), systemic symptoms (51.3%), episodic headache (50.4%), and neuropsychiatric alterations (47.7%). Joint manifestations were present in only 27.4% of cases [5].

Diagnosis

In a systematic review brain magnetic resonance imaging showed unilateral or bilateral involvement, predominantly supratentorial and frontoparietal. Both pachy- and leptomeninges were affected, the latter more frequently (82.88%). The laboratory findings included increased levels of rheumatoid factor (89.71%), anti-cyclic citrullinated peptide (89.47%), C-reactive protein (82.54%), and erythrocyte sedimentation rate (81.81%). Cerebrospinal fluid analysis showed an increase in the protein level (76.14%), with pleocytosis (85.19%) of mononuclear predominance (89.19%). Biopsy was performed in 72.52% of the patients [6].

MRI findings usually exhibit non-specific meningeal thickening and contrast enhancement [7].

CSF studies may be normal or show non-specific lymphocytic pleocytosis with protein elevation. The significance of increased Rheumatoid factor (RF) in the CSF is unclear [8].

Treatment

Corticosteroid pulse therapy was the main induction therapy [9].

Outcome

RA activity and time with the disease were associated with a worse prognosis.

Disease relapse occurred in 31.17% of patients, while 54.54% had a full recovery. [10].

Systematic review and meta-analysis

Villa et al. from the Hospital Clínico Universidad de Chile, Santiago, aimed to describe the characteristics of the disease, including clinical, imaging, and laboratory findings, treatment, outcomes, and prognosis reported in the literature.

They included 103 studies with 130 cases. RM affected adults with an average age of 62 years, with or without a previous diagnosis. RA activity and time with the disease were associated with a worse prognosis. The most common clinical manifestations were transient focal neurological signs (64.6%), systemic symptoms (51.3%), episodic headache (50.4%), and neuropsychiatric alterations (47.7%). Joint manifestations were present in only 27.4% of cases. Brain magnetic resonance imaging showed unilateral or bilateral involvement, predominantly supratentorial and frontoparietal. Both pachy- and leptomeninges were affected, the latter more frequently (82.88%). The laboratory findings included increased levels of rheumatoid factor (89.71%), anti-cyclic citrullinated peptide (89.47%), C-reactive protein (82.54%), and erythrocyte sedimentation rate (81.81%). Cerebrospinal fluid analysis showed an increase in the protein level (76.14%), with pleocytosis (85.19%) of mononuclear predominance (89.19%). Biopsy was performed in 72.52% of the patients. Corticosteroid pulse therapy was the main induction therapy. Disease relapse occurred in 31.17% of patients, while 54.54% had a full recovery.

RM must be considered in adult patients with or without RA diagnosis. These findings may aid clinicians in timely RM diagnosis and treatment, thus improving its outcomes [11].

Case reports

A patient with a 30-year history of RA, well-controlled with methotrexate therapy, presented with new-onset seizures. Magnetic resonance imaging showed leptomeningeal and pachymeningeal enhancement. A de novo workup resulted in a diagnosis of RM.

Cerebrospinal fluid findings for RM are nonspecific, typically lymphocytic pleocytosis; however, they can be neutrophilic, as in this case. Magnetic resonance imaging findings consist of leptomeningeal and pachymeningeal enhancement but can also involve the parenchyma. The diagnosis is typically confirmed with meningeal biopsy. Treatment involves high-dose corticosteroids or immunomodulatory therapy, or both. Long-term follow-up with radiologic surveillance typically ranges from improvement to resolution [12].

Finkelshtein V, Lampl Y, Lorberboym M, Kanner A, Ben-Ami Raichman D, Dabby R, Tanay A. Self-limited Rheumatoid Meningitis as a Presenting Symptom of Rheumatoid Arthritis. Isr Med Assoc J. 2018 Apr;20(4):262-264. PubMed PMID: 29629737.

1)
Bathon JM, Moreland LW, DiBartolomeo AG. Inflammatory central nervous system involvement in rheumatoid arthritis. Semin Arthritis Rheum 1989; 18: 258-66.
2)
Finkelshtein V, Lampl Y, Lorberboym M, Kanner A, Ben-Ami Raichman D, Dabby R, Tanay A. Self-limited Rheumatoid Meningitis as a Presenting Symptom of Rheumatoid Arthritis. Isr Med Assoc J. 2018 Apr;20(4):262-264. PubMed PMID: 29629737.
3) , 4) , 5) , 6) , 9) , 10) , 11)
Villa E, Sarquis T, de Grazia J, Núñez R, Alarcón P, Villegas R, Guevara C. Rheumatoid meningitis: a systematic review and meta-analysis. Eur J Neurol. 2021 May 9. doi: 10.1111/ene.14904. Epub ahead of print. PMID: 33966315.
7)
Cianfoni A, Falcone C, Faustini F, et al. Rheumatoid leptomeningitis: magnetic resonance imaging and pathologic findings – a case report. J Neuroimaging 2010; 20: 192-4.
8)
Kim HY, Park JH, Oh HE, Han HJ, Shin DI, Kim MH. A case of rheumatoid meningitis: pathologic and magnetic resonance imaging findings. Neurol Sci 2011; 32: 1191-4.
12)
Parsons AM, Zuniga LA, Hoxworth JM, Lyons M, Aslam F, Goodman BP. Rheumatoid Meningitis: A Case Review. Neurologist. 2018 May;23(3):83-85. doi: 10.1097/NRL.0000000000000158. PubMed PMID: 29722740.