Toxoplasma gondii

- Case Report: Mycobacterial epidural pyogranulomatous steatitis in a cat
- Brain Abscess Mimicking Brain Tumors: A Systematic Review of Individual Patient's Data
- Brain biopsy and metagenomic sequencing enhance aetiological diagnosis of encephalitis
- Dual-mode recognition of tRNA(Pro) isoacceptors by Toxoplasma gondii Prolyl-tRNA synthetase
- RNF213 Variant and Infectious Burden Associated With Intracranial Artery Stenosis in Moyamoya Disease
- Serum Biomarker Concentrations upon Admission in Acute Traumatic Brain Injury: Associations with TBI Severity, Toxoplasma gondii Infection, and Outcome in a Referral Hospital Setting in Cameroon
- Solitary Cerebellar Toxoplasmosis as the First Presentation of HIV Infection: A Case Report and Review of Literature
- Molecular Mimicry between Toxoplasma gondii B-Cell Epitopes and Neurodevelopmental Proteins: An Immunoinformatic Approach

Toxoplasma gondii is an obligate intracellular protozoan that is ubiquitous but does not cause clinical infection except in immunocompromised hosts. Histologic features: necrosis containing 2–3 nm tachyzoites (cysts).

In AIDS patients: Toxoplasma gondii is a common pathogen, and initial empiric therapy with sulfadiazine + pyrimethamine + leucovorin is often used.

Epidemiologic evidence suggests a protective effect of Toxoplasma gondii infection against multiple sclerosis (MS) development; however, inconsistent findings have been reported in this regard. Therefore, Rostami et al. performed an updated meta-analysis of observational studies to investigate the association of To. gondii infection with MS development. They searched all articles published in PubMed, Scopus, Embase, and Web of Science databases as of 20 December 2021. A random-effects meta-analysis model was used to generate the pooled OR at 95% CIs. The heterogeneity between studies was assessed using I2 and Cochran's Q statistics. Moreover, the likelihood of publication bias was determined by Egger's regression test. A total of 11 studies were eligible for meta-analysis, including 1172 MS cases and 1802 controls. Our findings indicated that 29.8% (95% CI 22.8 to 37.2%) of MS patients were seropositive for To. gondii infection, compared with 34.2% (95% CI 21.9 to 47.6%) of control subjects. The estimated pooled OR was 0.79 (95% CI 0.49 to 1.26), suggesting a non-significant negative association between To. gondii infection and MS development (p>0.05). The current study does not support the significant protective role of To. gondii infection on MS development. The findings imply that further well-designed epidemiological and mechanistic studies are warranted to ascertain the possible association between To. gondii infection and MS and to exclude the potential confounders [1].

Diagnosis

CT/MRI findings in toxoplasma abscess

1. most common findings: large area (low density on CT) with mild to moderate edema, ring enhancement with IV contrast in 68% compatible with abscess (of those that did not ring-enhance,

many showed hypodense areas with less mass effect, with slight enhancement adjacent to the lesion), well-circumscribed margins [2)]

2. most commonly located in basal ganglia are also often subcortical

3. often multiple (typically > 5 lesions [3)]) and bilateral

4. usually with little to moderate mass effect [4)] (in basal ganglia, may compress third ventricle and Sylvian aqueduct, causing obstructive hydrocephalus)

5. most patients with toxoplasmosis had evidence of cerebral atrophy.

Stereotactic biopsy guidelines:

a) if multiple lesions are present, choose the most accessible lesion in the least eloquent brain area, or the lesion not responding to treatment

b) biopsy the center of non-enhancing lesions or the enhancing portion of ring-enhancing lesions

c) recommended studies on biopsy: histology; immunoperoxidase stain for Toxoplasma gondii; stains for TB and fungus; culture for TB, fungi, pyogens

References

1)
Rostami A, Riahi SM, Mollalo A, Razavian I, Akbari N, Marhoommirzabak E, Mahjour S, Sartip B, Arshadi M, Razavian E, Ardekani A. Does latent Toxoplasma infection have a protective effect against developing multiple sclerosis? Evidence from an updated meta-analysis. Trans R Soc Trop Med Hyg. 2022 Jun 13:trac053. doi: 10.1093/trstmh/trac053. Epub ahead of print. PMID: 35696089.
2)
Jarvik JG, Hesselink JR, Kennedy C, et al. Acquired Immunodeficiency Syndrome: Magnetic Resonance Patterns of Brain Involvement with Pathologic Correlation. Arch Neurol. 1988; 45:731–736
3)
Sadler M, Brink NS, Gazzard BG. Management of Intracerebral Lesions in Patients with HIV: A Retrospective Study with Discussion of Diagnostic Problems. Q J Med. 1998; 91:205–217
4)
Ciricillo SF, Rosenblum ML. Use of CT and MR Imaging to Distinguish Intracranial Lesions and to Define the Need for Biopsy in AIDS Patients. J Neurosurg. 1990; 73:720–724