Management of Acute, Recurrent, and Chronic Meningitides in Adults

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KEYWORDS

• Meningitis • Bacterial • Viral • Aseptic
• Chronic • Management

By common usage, the term meningitis implies inflammation of the leptomeninges (the arachnoid and pia) and, by extension, involvement of the cerebrospinal fluid (CSF) in the subarachnoid space. In the rare pachymeningitis, inflammation predominantly affects the dura, and its causes and course are distinct from those of leptomeningitis. This review focuses on leptomeningitis, with the understanding that many processes may affect all 3 layers of the meninges simultaneously.

Meningitis may be further classified based on the time course. Most investigators distinguish between acute meningitis (with onset over hours to days) and chronic meningitis (syndrome persisting more than 4 weeks). Those meningitis syndromes evolving over several days but less than 4 weeks may be termed subacute, although the distinction between these and the other 2 categories is arbitrary. Recurrent meningitis is distinguished by symptoms that appear and then resolve completely between distinct episodes. Although there may be some etiologic overlap, the clinical distinction between acute, chronic, and recurrent meningitis is relevant because the causes and approaches to management are often different.

Meningitis typically manifests as headache, neck stiffness, light sensitivity, and varying degrees of neurologic symptoms and signs. Acute meningitis is more often accompanied by fever and mental status changes, whereas symptoms are more indolent in chronic meningitis. Furthermore, inflammation of the meninges sometimes extends into the parenchyma with resultant symptoms and signs of cerebral or spinal cord involvement, often termed meningoencephalitis or meningoencephalomyelitis. Viral syndromes in particular often cause a broad spectrum of neurologic disorders,

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but this article concentrates on those syndromes predominantly affecting the meninges.

The most common and often most severe forms of meningitis are due to infections, including bacteria, viruses, fungi, and parasites. Noninfectious causes of meningitis include primary inflammatory syndromes such as vasculitis and connective tissue disease, neoplasms of solid tumor and hematologic forms, and chemical irritants including certain medications, subarachnoid blood, and biologic matter spilling into the CSF from tumors. Although a patient may present with symptoms of meningitis within days of onset, distinguishing acute from subacute or chronic meningitis may not always be possible early in the course. Nevertheless, the distinction is important because of the varying urgency, causes, and treatment strategy involved in each syndrome. Although the list of possible causes of acute, chronic, and recurrent meningitis is extensive, this article focuses on the most important and treatable causes.

ACUTE MENINGITIS

The most common causes of acute meningitis are bacteria and viruses. Acute meningitis begins with the abrupt onset of headache, fever, and neck stiffness, with varying degrees of mental status change. Neck stiffness may be elicited on physical examination as pain and resistance to passive neck flexion, knee and hip flexion in response to passive neck flexion (Brudzinski sign), or resistance and pain to passive extension of the knee with the hip flexed (Kernig sign). However, these signs are not sensitive. Although patients may not present with all of these symptoms and signs, 95% of those with acute bacterial meningitis will have at least 2 of them, and 100% will have at least 1.[1–3] Additional, but less reliable, symptoms and signs may include photophobia, rash, nausea, seizures, or focal neurologic signs. Caution should be taken in immunocompromised, elderly, chronic alcoholic, and severely malnourished patients because typical symptoms may be lacking and meningitis may present with an acute confusional state or varying degrees of decreased level of alertness.

Patients presenting with these classic symptoms should be treated as an acute and potentially life- and brain-threatening emergency because morbidity and mortality are high with delayed treatment of bacterial meningitis.[4] History and examination should target the symptoms and signs noted earlier, as well as review for systemic clues and survey for rash and pulmonary consolidation. Petechial rash of the skin or oral mucosal suggests meningococcal infection. Oral, genital, and dermatomal vesicles (herpes simplex virus [HSV] and herpes zoster) offer causal clues. Blood cultures should be obtained immediately, because they will yield the offending organism in 50% to 75% of cases of bacterial meningitis.[2,4,5] Lumbar puncture (LP) should be performed as soon as possible for definitive diagnosis. Many patients will not require neuroimaging before performing LP. In patients with features that indicate increased risk of uncal or tonsillar herniation with removal of spinal fluid, head computed tomography (CT) should be carried out before performing LP. Risk factors include new onset seizure, immunocompromise, history of focal brain disease, decreased level of alertness, papilledema, or focal neurologic signs, in particular of cerebellar or brainstem dysfunction.[6,7] In cases in which LP is delayed, empiric antibiotics should be initiated at once as soon as blood cultures are obtained, and LP should still be attempted within 2 to 3 hours. Even when CT reveals no mass lesion, there may still be a risk for herniation in certain cases, especially those with depressed mental status or papilledema. LP should be deferred in these cases until the mental status improves or measures can be taken to lower the intracranial pressure.