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Letter to the Editor

Controlling Meningitis/Encephalitis in LMIC Countries is a Huge Task that can only be Accomplished through the Smooth Interaction of National and International Efforts

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Letter to the Editor

We read with interest the article by Gupta *et al.* commenting on improving the diagnosis and treatment of acute brain infections in low- and middle-income countries (LMICs) ^[1]. The commentary is accurate, but some points should be discussed. The treatment of meningitis/encephalitis in LMICs cannot be improved by a single measure alone; rather, many measures are needed at several national and international levels to improve diagnostic and therapeutic management and thus reduce the prevalence of meningitis/encephalitis in LMICs. Measures must be taken at the levels of health policy, economics, transportation, communication, environment, and epidemiology.

At the health policy level, it is necessary to provide the populations of all LMICs with comprehensive medical facilities capable of diagnosing meningitis/encephalitis and ruling out differential diagnoses. The number of neurological and intensive care units (ICUs) capable of performing lumbar punctures or suboccipital punctures must be increased. Sufficient radiological capacity must be available to perform brain imaging when meningitis/encephalitis is suspected. Since meningitis/encephalitis is usually a neurological emergency, there must also be enough emergency departments (EDs) available that can diagnose suspected cases of this disease. Physicians working in EDs must be trained to clinically diagnose suspected meningitis/encephalitis and initiate appropriate measures. They should be aware of the most important factors for diagnosis (fever, headache, neck stiffness in meningitis; altered mental status, seizures in encephalitis), blood tests (elevated CRP, leukocytosis), cerebrospinal fluid analysis, neuroimaging (MRI, CT), and epidemiological risk factors. (CSF). Rapid tests must be available around the clock to detect the most important neurotropic viruses and bacteria in CSF. Tests for diagnosing tuberculosis must be provided. Not only must the possibilities for diagnosing meningitis/encephalitis be improved, but also the possibilities for ruling out differential diagnoses. These include subarachnoid hemorrhages, autoimmune encephalitis, other autoimmune diseases, malignancies, paraneoplastic syndromes, intoxications, psychiatric disorders, and side effects of medications. Therefore, hospitals must be built in all LMICs that are equipped with both personnel and instruments, with suitable EDs, neurological departments, and ICUs to cope with both normal and increased rates of meningitis/encephalitis during epidemics. In addition, laboratories for the detection of viruses, bacteria, protozoa, and fungi in serum and CSF must be established nationwide. These laboratories should preferably be located in the most important hospitals. Health authorities are also called upon to organize campaigns to vaccinate the at-risk population against the most important neurotropic pathogens for which vaccines are available. Ministries and agencies of health, as well as state and local health departments responsible for disease control within their boundaries, are also called upon to eliminate vectors that transmit infectious diseases on a large scale. These agencies must work together to prevent, detect, and respond to public health threats through surveillance, policy measures, and direct intervention measures such as quarantine.

At the transport level, it must be ensured that the transport of tissue to be examined to external laboratories (if these are located outside hospitals) can be carried out smoothly and quickly and that the laboratories are staffed in such a way that results are available quickly. The speed of patient transport to major hospitals must also be improved, either by prioritizing patient transport by land on public transport or by expanding helicopter transport to hospitals.

At the economic level, the resources to finance all these necessary facilities must be made available. At the communication level, it must be ensured that the exchange of findings, additional information, and epidemiological data is guaranteed and can take place quickly at any time. At the epidemiological level, it must be possible to quickly determine whether the outbreak of

meningitis/encephalitis is individual, local, regional, national, or trans-national.

Overall, combating meningitis/encephalitis in LMICs is a daunting task that requires enormous efforts at many political and economic levels, as well as the smooth interaction of many forces and interest groups.

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References

1. Gupta A. Improving diagnosis and management of acute brain infections in low and middle-income countries. *Natl Med J India*, May-Jun 2025; 38(3):153-155. Doi: 10.25259/NMJI_701_2025