



Appendix

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.

Appendix to: Beaman MH. Community-acquired acute meningitis and encephalitis: a narrative review. *Med J Aust* 2018; 209: 449-454 doi: 10.5694/17.01073.

Table 1. Clinical clues in cases of suspected encephalitis¹⁻³

Clinical symptom or sign	Suggested aetiology
Seizures	HSV, HHV6 (immunocompromised adults)
Rash	VZV (vesicles), HHV6, enteroviruses, dengue virus, HIV
Progressive confusion	VZV, CMV (AIDS), rabies virus
Adenopathy	EBV, CMV, HIV
Meningoencephalitis	Enteroviruses, <i>Listeria</i> , EBV (immunocompromised)
Temporal lobe signs or symptoms	HSV
Cerebellar involvement	VZV (children, ataxia), MVE
Focal encephalitis	VZV (adults), <i>Toxoplasma</i> , HHV6
Thalamic involvement	MVEV
Brainstem involvement	MVEV, JEV (parkinsonism, 40% mortality), enteroviruses, poliovirus, melioidosis (<i>Burkholderia pseudomallei</i>), Nipah virus, tuberculosis
Spinal cord involvement	MVEV, poliovirus
Flaccid paralysis	Enteroviruses
Rhombo-encephalitis	<i>Listeria</i> , HSV, enterovirus 71
Cranial nerve palsies	<i>Borrelia burgdorferi</i> (esp. facial)
Hyperaesthesia at the site of inoculation	Rabies virus
Extremes of age	<i>Listeria</i>
Personality change	Syphilis, HIV, Whipple disease (<i>Tropheryma whipplei</i>), trypanosomiasis
Hydrophobia, delirium	Rabies virus, Australian bat lyssavirus
Parotitis	Mumps virus
Orchitis	Mumps virus
Neonates, Infants	HSV2, enteroviruses, CMV, <i>Listeria</i> , <i>Toxoplasma</i> , syphilis, HMPV, parechoviruses, influenza viruses

AIDS = acquired immunodeficiency syndrome; CMV = cytomegalovirus; EBV = Epstein-Barr virus; HHV6 human herpes virus 6; HIV = human immunodeficiency virus; HMPV = human metapneumovirus ; HSV = herpes simplex virus; JEV = Japanese encephalitis virus; MVEV = Murray Valley encephalitis virus; VZV = varicella zoster virus.

Table 2. Encephalitis pathogens, by geographic region^{1,2}

Region	Pathogen type	Viral family or disease	Pathogens
Northern Australia	Virus	<i>Flaviviridae</i>	Murray Valley, West Nile, Kunjin, Japanese encephalitis viruses
		<i>Rhabdoviridae</i>	Lyssa virus
		<i>Paramyxoviridae</i>	Hendra virus
	Bacteria	Scrub typhus	<i>Orientia tsutsugamushi</i>
		Leptospirosis	<i>Leptospira</i> (all serovars)
		Melioidosis	<i>Burkholderia pseudomallei</i>
	Parasite	Eosinophilic meningoencephalitis	<i>Angiostrongylus cantonensis</i>
Pacific	Virus	<i>Flaviviridae</i>	Japanese encephalitis, dengue, Zika viruses
	Bacteria	Tuberculosis	<i>Mycobacteria tuberculosis</i>
	Parasite	Malaria	<i>Plasmodia</i> spp. (encephalopathy)
		Eosinophilic meningoencephalitis	<i>Angiostrongylus cantonensis</i>
South Asia (incl. South East Asia)	Virus	<i>Flaviviridae</i>	Japanese encephalitis, dengue, Zika viruses
		<i>Paramyxoviridae</i>	Nipah virus (Malaysia, Bangladesh, India, Nepal)
		<i>Rhabdoviridae</i>	Rabies
		<i>Alphaviridae</i>	Chikungunya
	Bacteria	Scrub typhus	<i>Orientia tsutsugamushi</i>
		Typhoid	<i>Salmonella typhi</i> (encephalopathy)
		Tuberculosis	<i>Mycobacteria tuberculosis</i>
	Parasite	Malaria	<i>Plasmodia</i> spp.
		Eosinophilic meningoencephalitis	<i>Angiostrongylus cantonensis</i>
		Cysticercosis	<i>Taenia solium</i> , (esp. India)
North America	Virus	<i>Flaviviridae</i>	West Nile, St. Louis encephalitis, Powassan, Zika viruses
		<i>Rhabdoviridae</i>	Rabies virus
		Bunyavirales	California encephalitis virus group (California encephalitis, La Cross, Jamestown Canyon, Snowshoe Hare viruses)
		Coltivirus	Colorado tick fever virus
		Alphaviruses	Eastern and Western equine encephalitis viruses
		Arenavirus	Lymphocytic choriomeningitis virus
	Bacteria	Neuroborreliosis	<i>Borrelia burgdorferi</i>
		Human granulocytic anaplasmosis	<i>Anaplasma phagocytophilum</i>
		Human monocytic ehrlichiosis	Ehrlichia chafeensis
		Rocky mountain spotted fever	<i>Rickettsia rickettsii</i>

Region	Pathogen type	Viral family or disease	Pathogens
South America	Virus	<i>Flaviviridae</i>	West Nile, dengue, Zika, Rocio, Venezuelan equine encephalitis viruses
		Alphavirus	Chikungunya virus
	Bacteria	Tuberculosis	<i>Mycobacterium tuberculosis</i>
	Parasite	Chagas disease	<i>Trypanosoma cruzi</i>
Europe	Virus	<i>Flaviviridae</i>	Tick-borne encephalitis virus
		Bunyavirus	Toscana virus
		<i>Rhabdoviridae</i>	Rabies
		Arenavirus	Lymphocytic choriomeningitis virus
	Prion	Spongiform encephalopathy	Variant Creutzfeld–Jakob disease
	Bacteria	Neuroborreliosis	<i>Borrelia burgdorferi garinii</i> or <i>afzelii</i>
		Human granulocytic anaplasmosis	<i>Anaplasma phagocytophilum</i>
	Parasite	Toxoplasmosis	<i>Toxoplasma gondii</i>
		Trichinosis	<i>Trichinella spiralis</i>
Africa	Virus	<i>Rhabdoviridae</i>	Rabies virus
		<i>Flaviviridae</i>	Dengue virus
		Bunyavirus	Rift Valley fever virus
		<i>Alphaviridae</i>	Chikungunya
	Bacteria	Tuberculosis	<i>Mycobacterium tuberculosis</i>
		Leptospirosis	<i>Leptospira</i>
		Typhoid	<i>Salmonella typhi</i>
		Neuroborreliosis	<i>Borrelia burgdorferi</i> (N. Africa)
		Brucellosis	<i>Brucella</i> spp.
	Parasite	Trypanosomiasis	<i>Trypanosoma brucei gambesense</i> , <i>T. brucei rhodesiense</i>
		Cerebral malaria	<i>Plasmodia</i> spp.
	Fungi	Cryptococcosis	<i>Cryptococcus neoformans</i>

References

1. Beaman MH, Wesselingh SL. Acute community-acquired meningitis and encephalitis. *Med J Aust* 2002; 176: 389-396;
2. Britton PN, Eastwood K, Paterson B, et al.; Australasian Society of Infectious Diseases; Australasian College of Emergency Medicine; Australian and New Zealand Association of Neurologists; Public Health Association of Australia. Consensus guidelines for the investigation and management of encephalitis in adults and children in Australia and New Zealand. *Intern Med J* 2015; 45: 563-576.
3. Granerod J, Ambrose HE, Davies NW, et al. Causes of encephalitis and differences in their clinical presentations in England: a multicentre, population-based prospective study. *Lancet Infect Dis* 2010; 10: 835-844.