

Neurologic and Ophthalmologic Complications of Pediatric HIV Infection

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Objectives

- Review the range of neurologic and ophthalmologic complications of HIV infection in children
- Contrast the neuro-ophthalmologic complications seen in HIV infected children to those seen in adults

Spectrum of CNS Disorders

- CNS opportunistic infections
- Neoplasms
- Cerebrovascular disease
- HIV encephalopathy

CNS Opportunistic Infections

- Children <<< Adults
 - Reactivation disease
- Older children and adolescents
- Severe immunosuppression
- Congenital infections
 - Toxoplasmosis, CMV, syphilis

CNS Opportunistic Viral Infections

- Cytomegalovirus (CMV)
 - Congenital CMV (regardless of HIV)
 - Subacute or chronic encephalitis or ventriculitis
 - Adult pattern: rapid onset, headache, fever, delirium; cranial nerve deficits
 - CSF: neutrophilic pleocytosis, CMV PCR+
 - Acute ascending radiculomyelitis
 - paraparesis, leg areflexia, voiding dysfunction
 - CSF: neutrophilic pleocytosis, CMV PCR+
 - Acute/subacute neuritis
 - Treatment: ganciclovir; foscarnet; cidofovir; HAART

CNS Opportunistic Viral Infections

- HSV: (sub)acute encephalitis; acyclovir
- VZV: (sub)acute encephalitis; acyclovir
 - Fever, headache, altered behavior, seizures, focal deficits
 - May be preceded or accompanied by zoster
 - CSF: mild mononuclear pleocytosis, ↑ protein, VZV PCR+
- JC virus: Progressive multifocal leukoencephalopathy (PML)- rare
 - Progressive neurocognitive decline without headache or fever
 - White matter changes on MRI
 - CSF indices normal; JC PCR+
 - Treatment: HAART; cidofovir?

CNS Opportunistic Infections

- Toxoplasma encephalitis
 - Congenital vs Later onset disease
 - Undercooked meat; cats; contaminated water
 - Subacute: headache, fever, altered mental status, neurologic deficits
 - Intracranial mass lesions (usually multiple), ring-enhancing
 - Treatment: pyrimethamine/sulfadiazine (leucovorin); co-trimoxazole?

CNS Opportunistic Infections

- Acute bacterial meningitis
 - Usual pathogens
- *M. tuberculosis*
- Opportunistic pathogens
 - Non-tuberculous mycobacteria
 - *Listeria* spp
 - *Nocardia* spp.
 - *Cryptococcus* – much less common than adults

CNS Neoplasms

- Primary CNS lymphoma
 - Most common cause of CNS mass lesions in children with AIDS
 - Headaches, focal neurologic deficits, seizures; no fever
 - CSF: ↑mononuclear, ↑ protein; EBV PCR+
 - MRI/CT: Single or multiple enhancing lesions with prominent edema and mass effect

Cerebrovascular Disease

- Stroke
 - Most common cause of focal neuro deficits in children with AIDS
 - Hemorrhagic, embolic or vasculitic
- Vasculopathy
 - Stenosis and aneurysmal dilatation in the circle of Willis
 - Advanced immunosuppression
 - Primary HIV vs secondary cause (eg, VZV)

HIV Encephalopathy

- Very common in children in preHAART era
- Infants and young children at highest risk
 - Developing brain; In utero infection
 - Presenting sign of HIV infection
- Triad: motor/language delays, acquired microcephaly, pyramidal tract deficits (CP)
- Patterns
 - Subacute progressive: loss of milestones
 - Plateau: slower or absent gains
 - Static: fixed deficits
- Treatment: HAART (ZDV)
- Learning and behavior problems

Ophthalmologic Disorders

- Annual exams where resources allow
- CMV Retinitis
 - most common ophtho OI but less than in adults; congenital (not HIV related)
 - Severe immunosuppression (HIV related)
 - Variable pace; Silent; Detachment; Blindness
 - Treatment: systemic and intraocular
- Toxoplasma Retinochoroiditis
 - Congenital vs HIV-related
 - Detachments, uveitis, blindness
 - Treatment: systemic
- HIV retinopathy- progressive outer retinal necrosis-> rapid painless vision loss– VZV, HSV

Summary

- CNS OIs less common than in adults
- Focal neurologic deficits: stroke, CNS lymphoma >toxoplasmosis, cryptococcus
- HIV encephalopathy common in untreated, young children
- Ocular manifestations – CMV, Toxoplasmosis