Neuroradiology in sub-Saharan Africa – what can, should, must be done

In Auto-immune & Post infectious diseases of the CNS

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11th September 2021
Disclosure

I have nothing to disclose in relation to this presentation
Outlines of the Talk

• Panoramic View:
  • Autoimmune Disorders of the Nervous System
  • Para (Post)-Infectious Disorders of the Nervous System

• What can be done:
  • Neuroradiological Modalities
  • The best modality for Which disorder?

• Limitations (What should be done?)

• The Future
Autoimmune Disorders of the Nervous System

Multiple Sclerosis
Transverse myelitis - isolated
Neuromyelitis Optica and NMO spectrum Disorders
Neuro Lupus
Hashimoto’s encephalitis
ADEM
Limbic Encephalitis- autoimmune type
Para-Infectious Disorders of the Nervous System

- Post Infectious Angiitis (HZV, TB Angiitis)
- Post HS encephalitis / steroid Responsive Encephalitis
- Post Malarial Neurological Syndrome/ Cerebellitis
- Subacute sclerosing panencephalitis- SSPE (Post measles)
- COVID-19 associated neurological disorders
- Progressive Multifocal Leukoencephalopathy (JCV)
- HIV encephalitis/ brain atrophy
- Post poliomyelitis Syndrome
- Neurosyphilis
- Immune reconstitution Syndrome
- Prion Diseases
Post Malaria Neurological Syndrome (PMNS)

- Post-malaria neurological syndrome (PMNS) is an uncommon, monophasic illness that occurs within two months following recovery from *Plasmodium falciparum* (Pf) malaria.
- Clinical manifestations of PMNS are variable, but published cases uniformly feature neurological and/or psychiatric symptoms without long tract signs.
- There is a case report of severe brainstem and spinal cord inflammation with paraplegia and sphincter involvement in a 48 year old woman following recovery from a Pf malarial illness.
- They proposed that this case represents a previously unreported form of PMNS, which has features that distinguish it from ADEM

Post Malaria Neurological Syndrome (PMNS)
Malaria retinopathy and cerebellitis in a 9-year-old boy in the United States

Nafiseh Hashemi, MD, a,b Lauren M. Callon, BA, a and Kartik S. Kumar, MD a,c

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4351814/
COVID-19 Associated Neurological Disorders

Potential mechanisms and complications of NeuroCOVID
Neuroradiological Findings in COVID-19

• Encephalitis
• Cerebral Oedema
• ADEM
• Stroke
• Vasculitis –Moyamoya Syndrome
• Leukoencephalopathy
• ICH- micro and macro bleeds
• Dural Sinus thrombosis

https://www.dropbox.com/s/q9spig67o7eabe6/Screenshot%202021-08-01%2017.40.png?dl=0
The Spectrum of Neuroimaging findings on CT and MRI in Adults with Coronavirus Disease (COVID-19)

Gul Moonis, MD, Christopher G. Filippi, MD, Claudia F. E. Kirsch, MD, Suyash Mohan, MD, Evan G. Stein, MD, PhD, Joshua A. Hirsch, MD, Amit Mahajan, MBBS

https://doi.org/10.2214/AJR.20.24839
Accepted: November 17, 2020

The complete title page, as provided by the authors, is available at the end of this article.

Abstract

Neurologic involvement is well-recognized in coronavirus disease (COVID-19). This article reviews the neuroimaging manifestations of COVID-19 on CT and MRI, presenting cases from the New York City metropolitan region encountered by the authors during the first surge of the pandemic. The most common neuroimaging manifestations are acute infarcts with large clot burden and intracranial hemorrhage, including microhemorrhages. However, a wide range of additional imaging patterns occur, including leukoencephalopathy, global hypoxic injury, acute demyelinating encephalomyelitis, cytotoxic lesions of the corpus callosum, olfactory bulb involvement, cranial nerve enhancement, and Guillain Barre syndrome. The described central nervous system abnormalities largely represent secondary involvement from immune activation that leads to a prothrombotic state and cytokine storm; evidence for direct neuroinvasion is scant. Comorbidities such as hypertension, complications of prolonged illness and hospitalization, as well as associated supportive treatments, also contribute to the central nervous system involvement in COVID-19. Routine, long-term, neurologic follow-up may be warranted, given emerging evidence of long-term microstructural and functional changes on brain imaging after COVID-19 recovery.
Neurological complications of COVID-19 in hospitalized patients: The registry of a neurology department in the first wave of the pandemic

Sofía Portela-Sánchez1, Antonio Sánchez-Soblechero2, Pedro José Melgarejo Otalora3, Ángela Rodríguez López1, Gabriel Velilla Alonso1, Michael Armando Palacios-Mendoza1, Carlos Cátedra Caramé1, Laura Amaya Pascasio2, Miguel Mas Serrano1, Andreu Massot-Tarrús1, Beatriz De La Casa-Fajez1,2, Fernando Díaz-Otero1, Irene Catalina1, José Manuel García Domínguez1, Javier Ricardo Pérez-Sánchez1, José Luis Muñoz-Blanco1,3, Francisco Grandas1,3
Imaging Modalities

• Plain X rays - No much role
• CT scan:
  • PLAIN - bleeding/ Calcification
  • With Contrast- Inflammatory/ Vascular patterns
• MRI:
  • Plain - T1, T2, FLAIR, T2*, MWI,
  • With Contrast – BBB, inflammatory, Vascular Patterns
  • FLAIR- Inflammatory
  • MR- Spectroscopy (Tumour Versus Inflammatory)
  • MR Angio/ venography- Vascular patterns
  • Functional MRI - Future
• SPECT – active lesions/ metabolic disorders
• PET scan – Paraneoplastic autoimmune
• Magnetization Transfer
• Tractopgraphy
What is the best Modality?

• Case 1
• Will show illustrative Case Autoimmune disorder
What is the best Modality?

• Case 2

  Will show illustrative Case of a Para-infectious disorder
What is the best Modality?

• Case 3

A case of incidental finding? Differential diagnosis and Relevance
Limitations of Imaging Techniques in Africa

• Availability
• Affordability
• Tolerability
• Trained Personnel:
  • Technicians
  • Radiologists
  • Neureologists
The Future in Imaging for Inflammatory CNS Disorder

• Tele-neuroradiology
• More equipments - reduced cost
• Training for early recognition– early management
• Research in new patterns ( COVID-19, Malaria, Leishmanisis, Trypanosomiasis)
• New Modalities:
  • Tractography ( HTLV, tropical Spastic paraparesis)
Useful Resources

- https://learnneuroradiology.com/

- https://www.youtube.com/c/LearnNeuroradiology
Thank You