

Profile of Neurological manifestations of Covid 19 in a Pediatric Hospital in Delhi

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Introduction

The acute neurological manifestations of COVID-19

predominant acute presentations of COVID-19 are respiratory

However:

neurological manifestations even in cases without respiratory symptoms

The neurological manifestations associated with COVID-19

- range from mild to critical
- affect adults and children
- can present both during and after acute COVID-19 infection

Possible mechanisms Neurological Involvement

Endothelial injury
Promotion of inflammation
Accumulation of inflammatory cells
Basement membrane
D-dimer

Direct viral effects
Can infect various cells that make up the nervous tissue including neuroblasts, astrocytes, microglia, and oligodendrocytes.
Neuronal death

Post-infectious inflammation
Headache
Seizure
Encephalopathy
Altered mental status
Cerebral edema
CN palsy
Demyelination
ADEM
GBS

Para-infectious inflammation
Fatigue
Headache
Febrile seizure
Encephalopathy
Altered mental status

MIS-C markers
C-reactive protein, ESR
fibrinogen, D-dimer, ferritin,
IL-6, pro-calcitonin, BNP, troponin

Endothelial injury
thrombotic events
release inflammatory mediators

Para-infectious - Cytokine release
due to pulmonary or systemic infection may instigate neurological sequelae.

Post-infectious inflammation
trigger autoimmune phenomena, such as demyelinating disease and encephalopathy

The multisystem inflammatory syndrome in children: may represent a spectrum of para- and post-infectious complications

Objectives

To study the profile of Neurological manifestations of Covid 19 in a Pediatric hospital in Delhi

Material and methods

Records of all Covid positive children 1 month to 18years of age were accessed from 01 Jan 21 to 31 March 2022.

Children were presumed to have the delta variant up to 30 Nov 2021 and Omicron variant after that.

A child was considered to have Covid if

- (a) the RT – PCR / Rapid antigen was positive, or
- (b) covid antibodies were present
- (c) MIS-C if inflammatory markers were present.

All children requiring hospital or ICU admission were reviewed for the occurrence of neurological manifestations. The types of neurological manifestations were noted and categorized according Acute or MIS-C phase of the illness.

Results

Table 1 : PEDIATRIC COVID 19 CASES FROM 01 JAN 2021 to 30 Nov 2021 (Delta Variant)

	Total cases 160	Acute Covid 133 (83.1%)	MIS-C 27 (16.8%)
Male	87 (54.4%)	67 (50.4%)	20 (74.1%)
Female	73 (45.6%)	66 (49.6%)	07 (25.9%)
Neurological Manifestations	23 (14.3%)	15 (11.2%)	8 (29.6%)

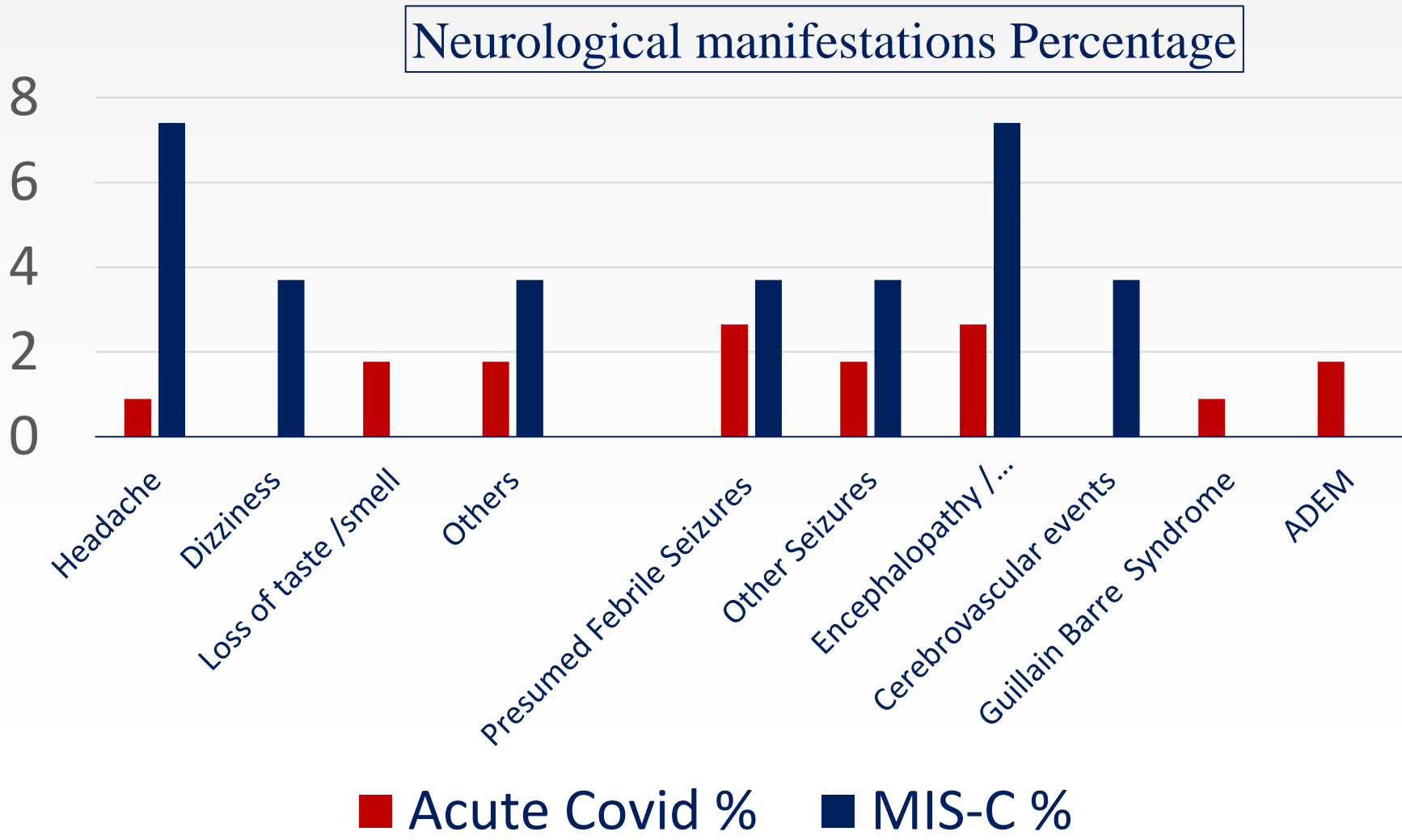
(2 patients had multiple manifestations)

Table 2 : PEDIATRIC COVID 19 CASES FROM 01 Dec 21 to 31 Mar 22

	Total cases 39	Acute Covid 38	MIS-C 01
Male	25 (64.1%)	24	01
Female	14 (35.9%)	14	01
Neurological Manifestations	08 (20.55%)	08	0

PROFILE OF NEUROLOGICAL MANIFESTATIONS

Neurological Manifestation	Total	Acute Covid	MIS - C
Subjective			
Headache	3	1	2
Dizziness	1	0	1
Loss of taste /smell	2	2	0
Others	3	2	1
Objective/ serious			
Presumed Febrile Seizures	4	3	1
Other Seizures	3	2	1
Encephalopathy / Encephalitis	5	3	2
Cerebrovascular events	1	0	1
Guillain Barre Syndrome	1	1	0
ADEM	2	2	0



Brief Discussion

In literature: subjective symptoms like headache, dizziness and loss of smell/taste are the commonest neurological manifestation reported in other series.

In this review, these were seen only in a few cases, because during the delta wave the hospital was too full and we did not actively ask for this symptom.; it was only noted if the child complained of it.

The spectrum of other disorders is similar to other studies

Conclusions

- Overall Neurological manifestations were seen 14% of covid cases,
- They were more common in the MIS-C children.
- Serious Neurological manifestations were seen in the Delta variant Covid 19.
- Febrile seizures were the only neurological manifestation in the omicron variant.

References

Favas TT et al. Neurological manifestations of COVID-19: a systematic review and meta-analysis of proportions. *Neurol Sci.* 2020 Dec;41(12):3437-3470.

LaRovere KL, et al. Neurologic Involvement in Children and Adolescents Hospitalized in the United States for COVID-19 or Multisystem Inflammatory Syndrome. *JAMA Neurol.* 2021 May 1;78(5):536-547

Prateek PK, et al. Neurological Complications of SARS-CoV-2 Infection in Children: A Systematic Review and Meta-Analysis, *Journal of Tropical Pediatrics*, Volume 67, Issue 3, June 2021

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