

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

COVID-19 Meningitis : Case Report

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Introduction:

- ▶ Up to 50% of children and adolescents might have COVID-19 with **no symptoms**
- ▶ COVID-19 infection in children has been usually presented with **respiratory and gastrointestinal symptoms**.

some children with COVID-19 need to be hospitalized, treated in the intensive care unit or placed on a ventilator to help them breathe.

COVID19 and CNS

COVID-19 infection had variety of clinical manifestation in pediatric cases and it mimics a lot of other viral and bacterial infections' manifestations

Although severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) predominantly infects the respiratory system, involvements in other body organs such as the **cardiovascular system, kidneys and liver were reported.**

MIS-C

COVID19 and CNS

- ▶ several investigations have shown the involvement of the central nervous system (CNS) with covid19
- ▶ in 71 articles that screening showed that 10 adult and 4 pediatric cases were reported with COVID-19 meningo-encephalitis.

systematic review in this regards that mentioned 54 cases
(mean age 50.8 ± 19 years) (2020)

reported to have COVID-19 related meningo encephalitis
in which just 3 cases had positive CSF PCR for COVID-19.

COVID-19 and Acute Neurologic Complications in Children(2022)

-Of **15137 children hospitalized with COVID-19**, 1060 (**7.0%**) had a concurrent diagnosis of a neurologic complication.

The **most frequent neurologic complications** were

- ▶ febrile seizures (3.9%),
- ▶ nonfebrile seizures (2.3%),
- ▶ encephalopathy (2.2%).

ICU admission, deaths, and hospital costs were higher in children with neurologic complications compared with those without complications

Neurologic Complications in Children Hospitalized With COVID19

- ▶ Febrile seizure 582 (38.9%)
- ▶ Non febrile seizure 352 (23.6%)
- ▶ Encephalopathy 332 (22.2%)
- ▶ **Aseptic meningitis 26 (1.74%)**
- ▶ Encephalitis 19 (1.27)
- ▶ Brain abscess & bacterial meningitis 19 (1.27)
- ▶ Cerebral infarction 8 (0.54)
- ▶ Reye syndrome 0 0.00 0.00

Case presentation:

- ▶ **13 months male infant** was admitted in the emergency department with fever, poor feeding, irritability, vomiting from 1 day ago
- ▶ The infant's weight, height and head circumference were normal, cognitive and motor development was normal, but speech development had mild delay. **No respiratory symptom was observed.** Other physical examinations were normal.
- ▶ 12 hours after admission Upward gaze, and tonic-clonic movements occurred. **diazepam** was injected intravenously but the seizures continued, so, **Phenobarbital** was administered but seizure was repeated in an hour and prolonged more than 15 minute, so, **Phenytoin** were loaded.

WBC Count	18.8	5.6-17
RBC Count	4.76	3.7-5.2
HB	12.4	10.5-14.1
Hct	36.2	31-46
MCV	76.05	72-88
MCH	26.05	24-31
MCHC	34.25	34.2-35.7
Plt	450	210-560
RDW-CV		11-14
RDW-SD	38.0	35-56
%Poly	67.7	50.0-70.0
%Lymph	25.1	11.0-49.0
MXD	7.2	
%Monocyte		4.0-11.0
%Eosinophil	ESR: 7	1.0-6.0
#N-RBC	CRP: 3.5	
#Poly	U/A: NL	
#Lymph		
#Mon		
#Eos		
#Bas		

LP result

Appearance clear

Glucose 145

Pr 28

WBC 400

RBC 100

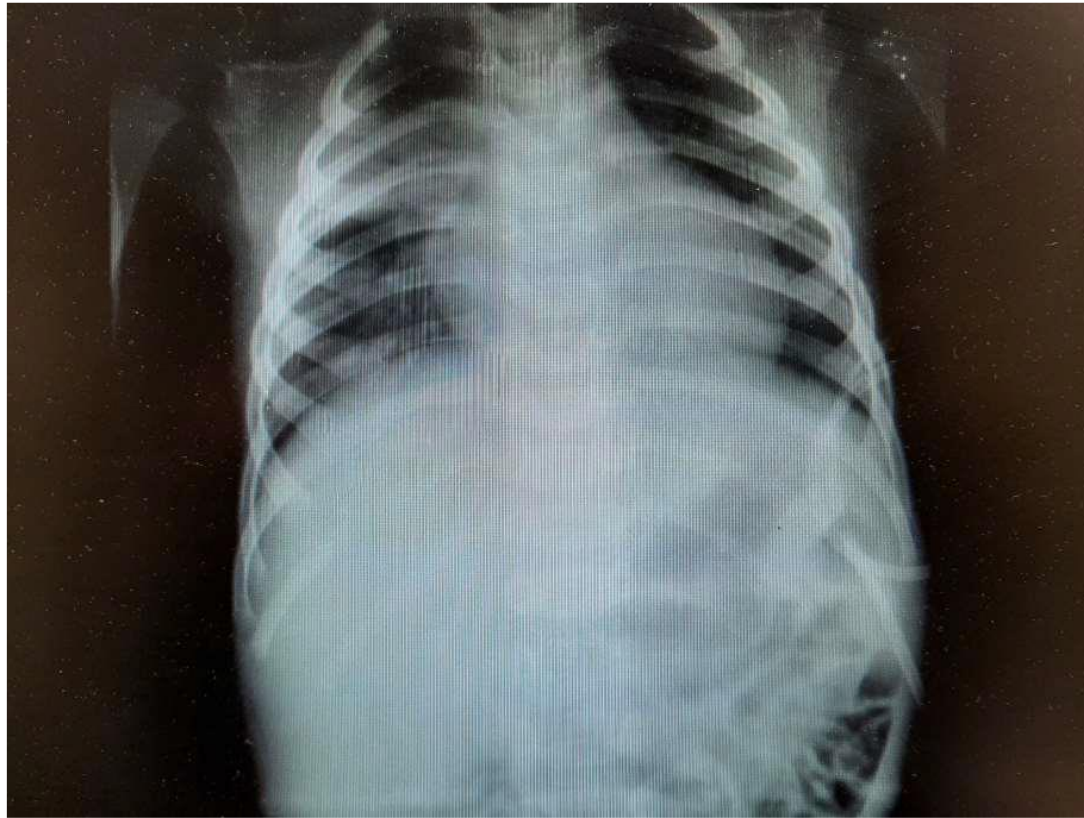
Poly 30

Lymph 70

Management

- ▶ The patient received **Cefotaxime, Vancomycin, Acyclovir,**
- ▶ In the other day patient was very hypotonic and also had poor sucking. He had some cough with normal respiratory rate and oxygen saturation.

Chest X ray



After 24 hours

- ▶ **COVID-19 PCR of pharyngeal and CSF samples both became positive**, while, CSF culture, and CSF PCR for common germs of meningitis and encephalitis were negative. So, Cefotaxime and Vancomycin were continued for aspiration pneumonia and Acyclovir was discontinued

Covid19 treatment

- ▶ Dexamethasone continued for 5 days more
- ▶ Remdesivir (first day 5 mg/kg and next four days 2.5 mg/kg) was added

A) Panel of Pathogens Causing Viral Meningitis

No.	Test	Pathogen Detected	Result
1	HSV-1	<i>Herpes Simplex Virus -1</i>	<i>Negative</i>
2	HSV-2	<i>Herpes Simplex Virus -2</i>	<i>Negative</i>
3	CMV	<i>Cytomegalovirus</i>	<i>Negative</i>
4	EBV	<i>Epstein Barr Virus</i>	<i>Negative</i>
5	VZV	<i>Varicella-Zoster Virus</i>	<i>Negative</i>
7	EV	<i>Enterovirus.</i>	<i>Negative</i>
8	HPeV	<i>Parechovirus</i>	<i>Negative</i>

A) Panel of Pathogens Causing Bacterial Meningitis

No.	Test	Pathogen Detected	Type of Diagnosis
1	MTBc	<i>Mycobacterium tuberculosis complex</i>	<i>Negative</i>
2	SPNEU	<i>Streptococcus pneumonia</i>	<i>Negative</i>
3	Leptospira	<i>Leptospira interrogans</i>	<i>Negative</i>
4	HINF	<i>Haemophilus influenzae</i>	<i>Negative</i>
5	LEIS	<i>Leisteria monocytogenes</i>	<i>Negative</i>
6	N.meningitidis	<i>Neisseria meningitidis (ctrA)</i>	<i>Negative</i>
7	N.meningitidis (sod)	<i>Neisseria meningitidis (sod)</i>	<i>Negative</i>
8	CRYPT	<i>Cryptococcus neoformans (fungus)</i>	<i>Negative</i>

Corona Virus PCR

Positive.

N gene (CT)

35

RdRp gene (CT)

33

Specimen

Nasopharyngeal and Thro...

Corona Virus PCR

Positive.

N gene (CT)

29

RdRp gene (CT)

28

Specimen

CSF

After 2 days fever, hypotonia resolved.

A week after convulsion, some papular lesions were appeared on the stomach and thigh.

Papular lesions were disappeared after stopping phenobarbital with cetirizine therapy. Clobazam was added instead of phenobarbital.

After 10 days infant was discharged with **anti-seizure medication**. Due to **speech delay**, the neurologist recommended Auditory Brainstem Response test and outpatient follow-up of developmental status.

Discussion

- ▶ COVID-19 infection had variety of clinical manifestation in pediatric cases and it mimics a lot of other viral and bacterial infections' manifestations such as viral meningitis.
- ▶ a 5 months infant presented with the history of 4 days of COVID-19 general symptoms, then meningitis progressed and its general condition worsened until **IVIG** administration.
- ▶ In the other article a neonate with poor feeding and lethargy had been worked up for sepsis and his general condition improve with **supportive treatments**

Conclusion

Meningitis of COVID-19 should be considered in severely ill pediatric cases specially with poor controlled seizure

Treatment?

