Infections-associated OMAS: Do we need to approach differently?

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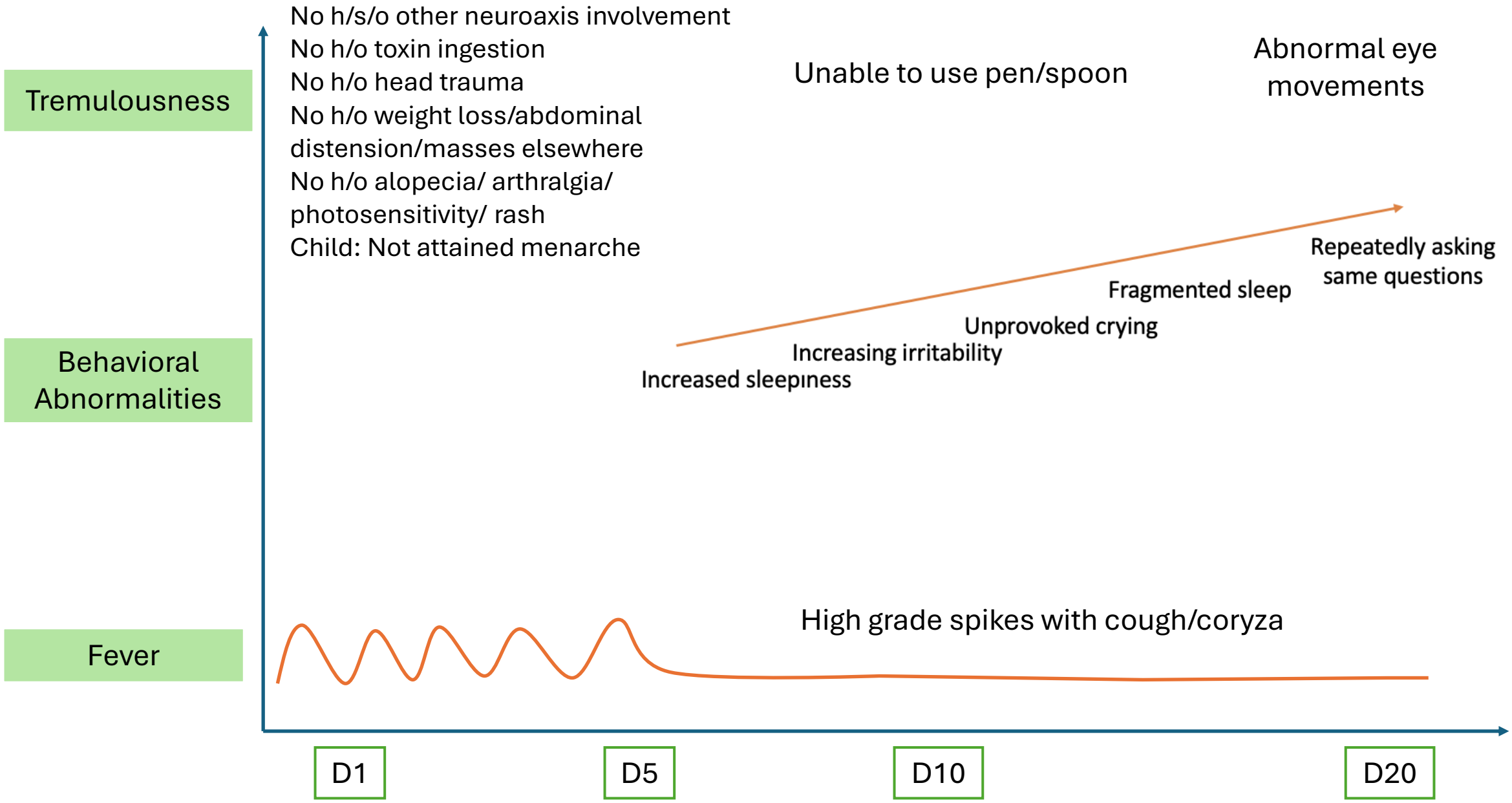
Disclosures

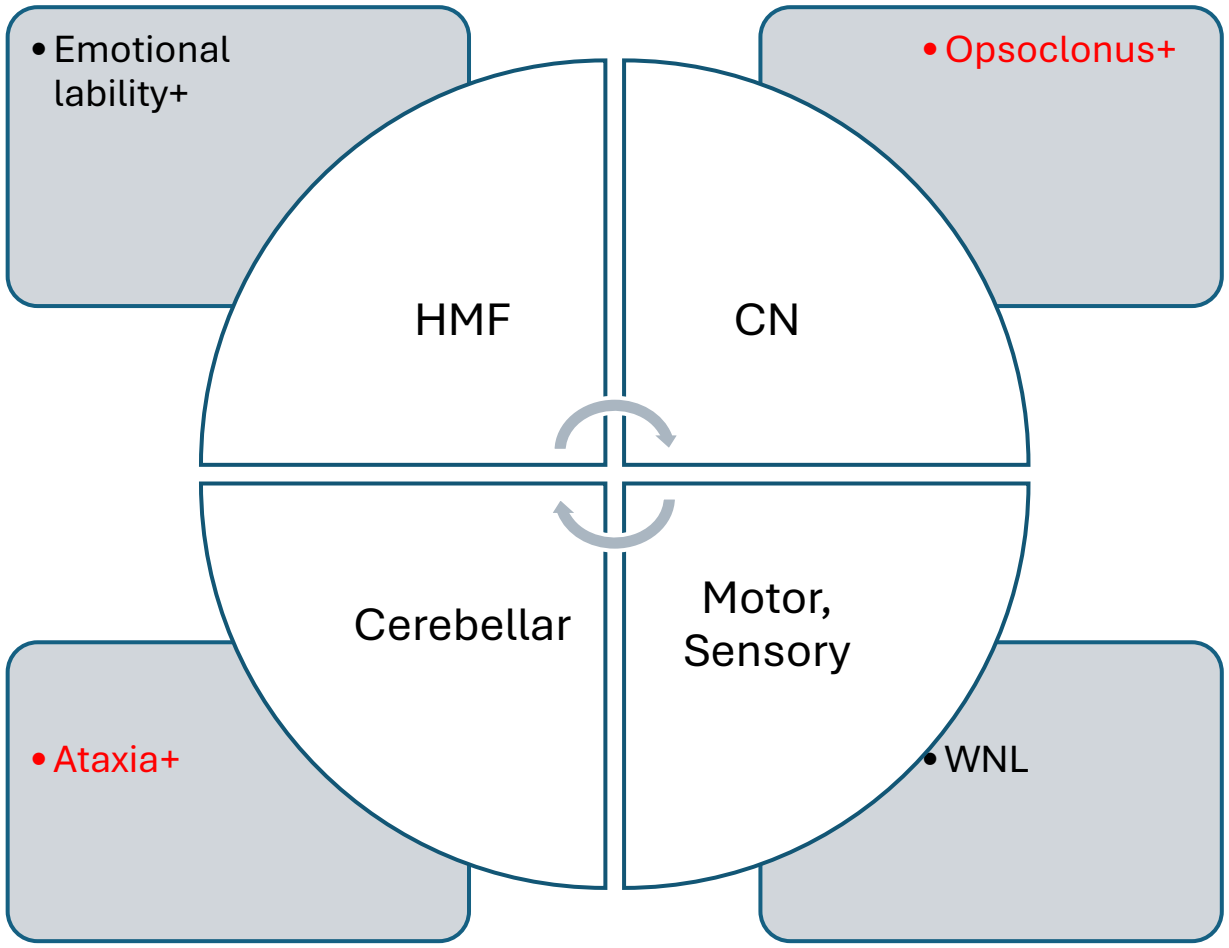
- None

Case



11 years old/girl

NEUROLOGICAL EXAMINATION



Investigations

CSF (23/12/2024)

Cells: 49 (N33/M67)

S/P: 82/42.7

ANA: Negative

Anti-TPO: Negative

CXR: WNL

USG Abdomen and Pelvis: WNL

Age / Sex	11 Y/FEMALE	Visit Type	OP
Sample No	AU2612240061	Collected On	26/12/2024 15:56
Lab Reference No	XAU-12254	Received On	26/12/2024 15:56
Consulting Doctor	PGIMER	Reported On	28/12/2024 16:33

Test Name	Result	Comments
Autoimmune Encephalitis Mosaic - CSF (NMDA and VGKC)		
Glutamate receptor, NMDA	Negative.	
Glutamate receptor, AMPA1	Negative.	
Glutamate receptor, AMPA2	Negative.	
CASPR (contactin - associated protein 2/VGKC associated)	Negative.	
LGI-1 (Leucine rich glioma-inactivated protein 1/ VGKC associated)	Negative.	
GABAB receptor (GABAB1,B2)	Negative.	

Treatment, Course and follow up

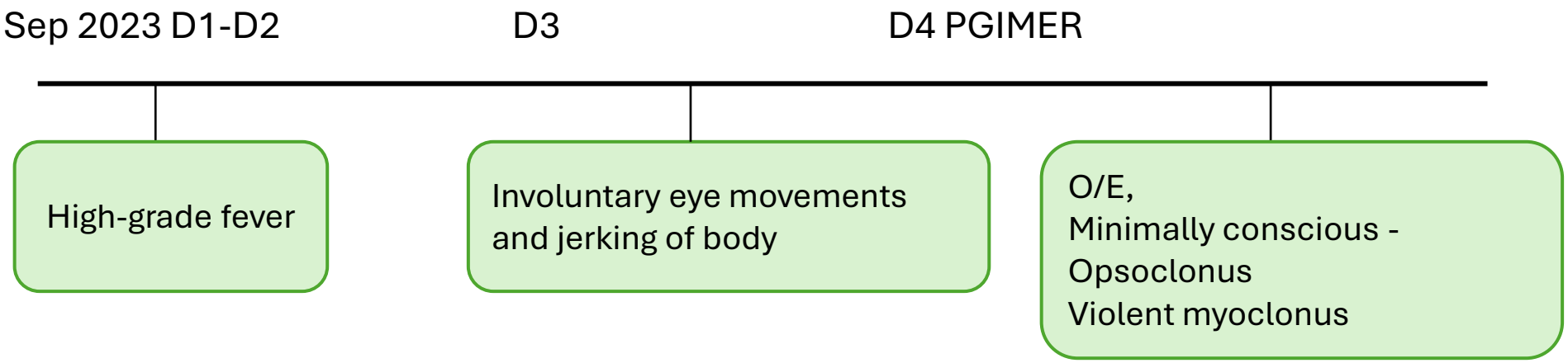
Pulse methylprednisolone* 5 days

1 month F/up

4 month F/up

Case 5

- **11 year boy**
- **Previously well**



MRI brain – normal

Dengue IgM - positive in patient and sibling with fever

Methylprednisolone pulse for 5 days

Final diagnosis:

Infection (Dengue) triggered opsoclonus/myoclonus

Recovered in a week

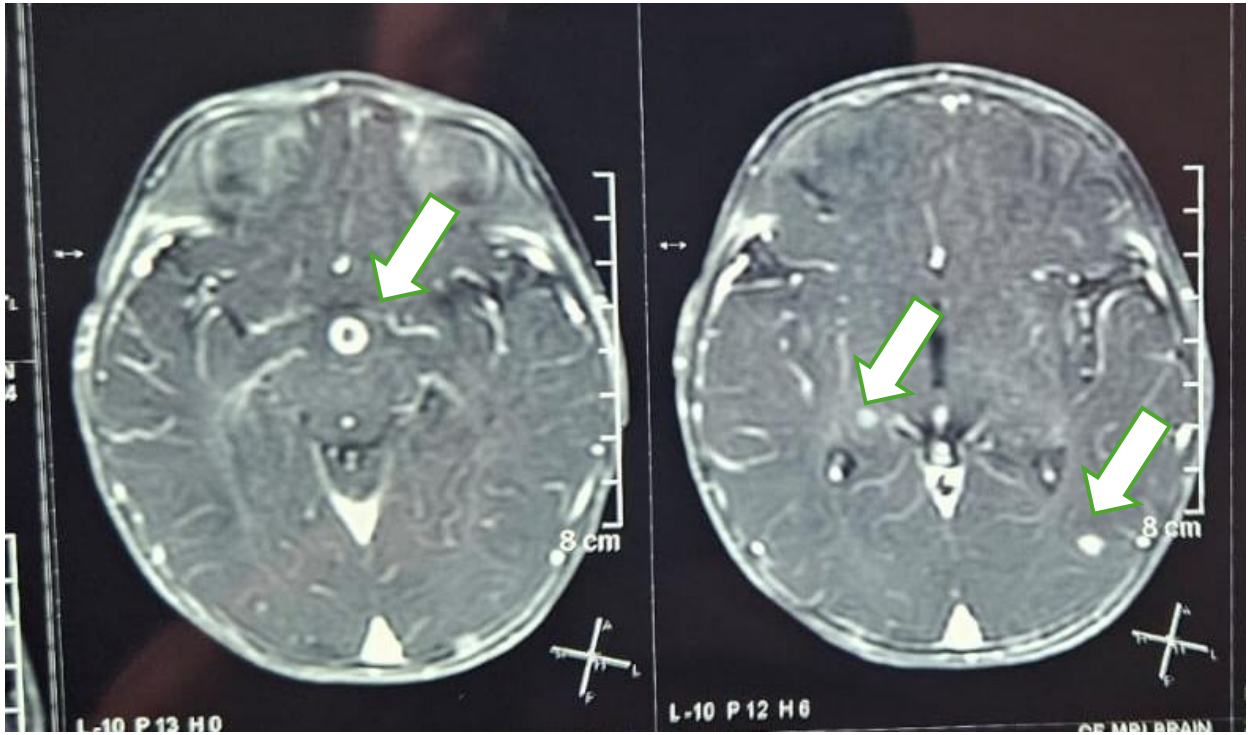
Case

- 9-mo-old
- Girl
- Irritable -10 days
- Involuntary eye movements, head jerks- 10 days
- Mild motor delay
- No fever

Mimics

- Mother died soon after giving birth due to severe tuberculosis
- Index child
- Calcified nodules in the liver and spleen
- Healed choroid tubercles
- Abnormal areas of small nodules on CXR
- Final diagnosis: **Pulmonary TB with Intracranial Tuberculomas with optic pathway involvement**

- Started on Antitubercular therapy with steroids



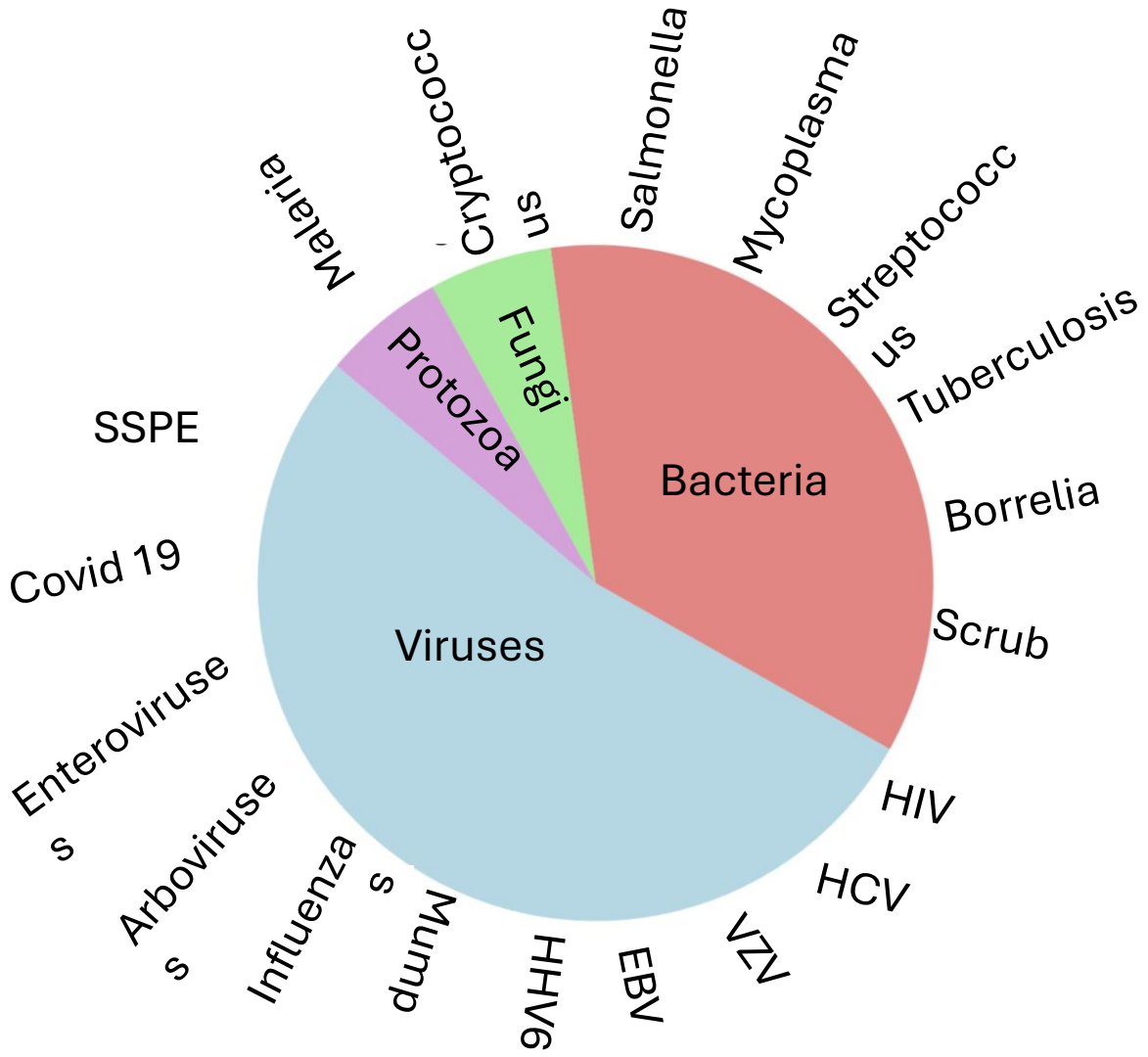
Tuberculomas involving Optic Chiasma, Rt Thalamus and left parietooccipital lobe

Case

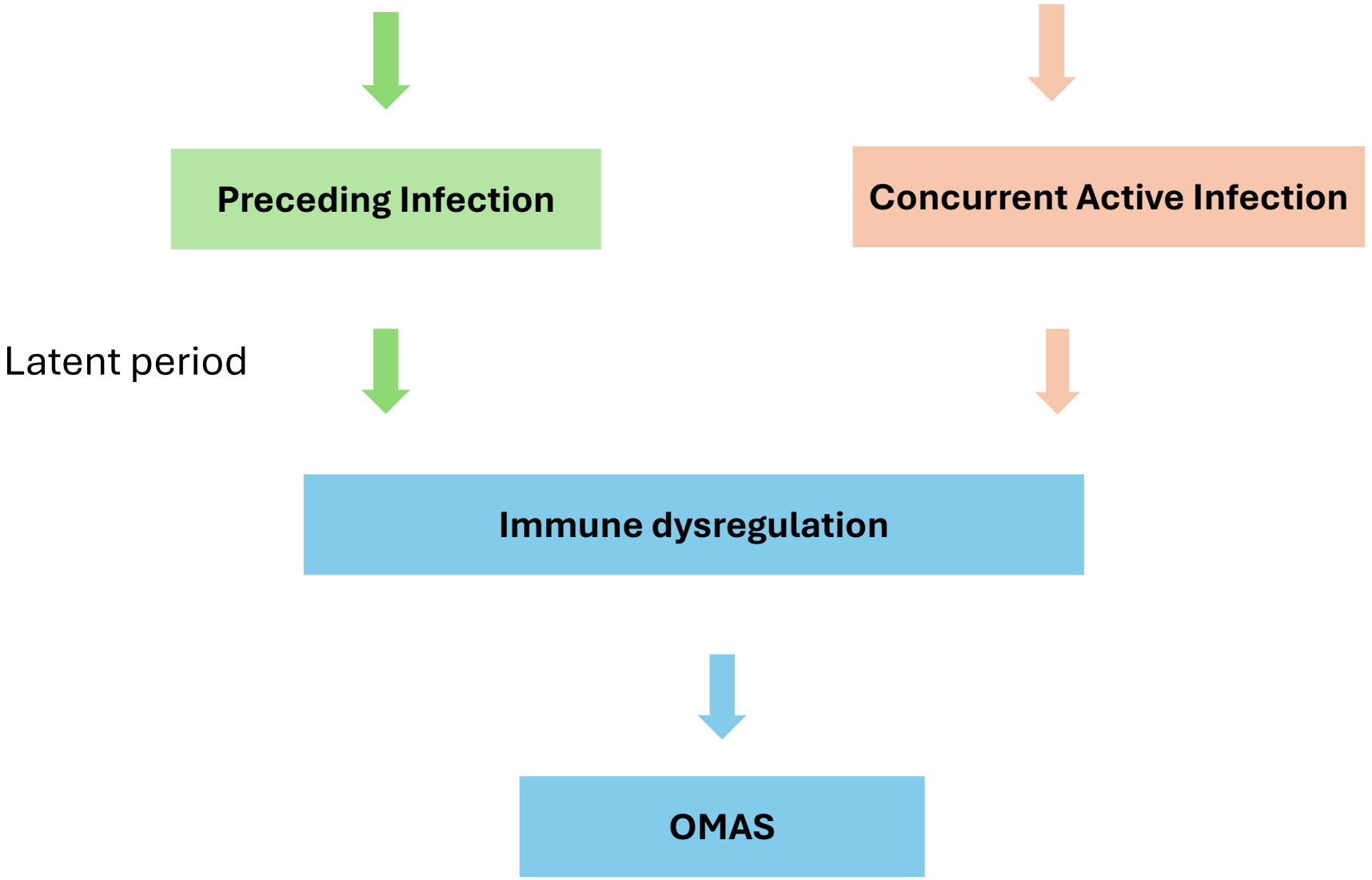
- 9-yr-girl
- Fever 7 days
- Difficulty walking
- Involuntary fast eye movements- OPSOCLONUS- 3 days

- Investigations:
- Raised AST/ALT
- Low platelets
- Serology positive for SCRUB TYPHUS

INFECTION ASSOCIATED OMAS

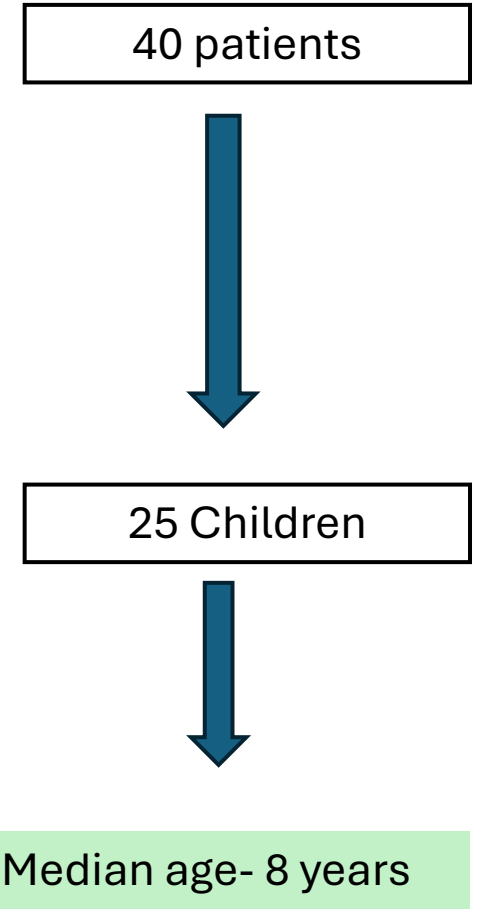


Infection Triggered Vs Infection Associated Omas



Infections Associated OMAS

- **PUBMED:**
- Key words: Opsoclonus myoclonus
- **Filters**: Case Reports, Clinical Study, Clinical Trial, Observational Study, Pragmatic Clinical Trial, **Child: birth-18 years**
- 186 reports
- 27 were reports of infection-associated



7 Adults
1 not OMAS
1 not Infection-Associated
2 had infection and tumor
1 , 2 month old with Pyo meningitis
1- HIV- Died
1-TBM
1 SSPE

Infections

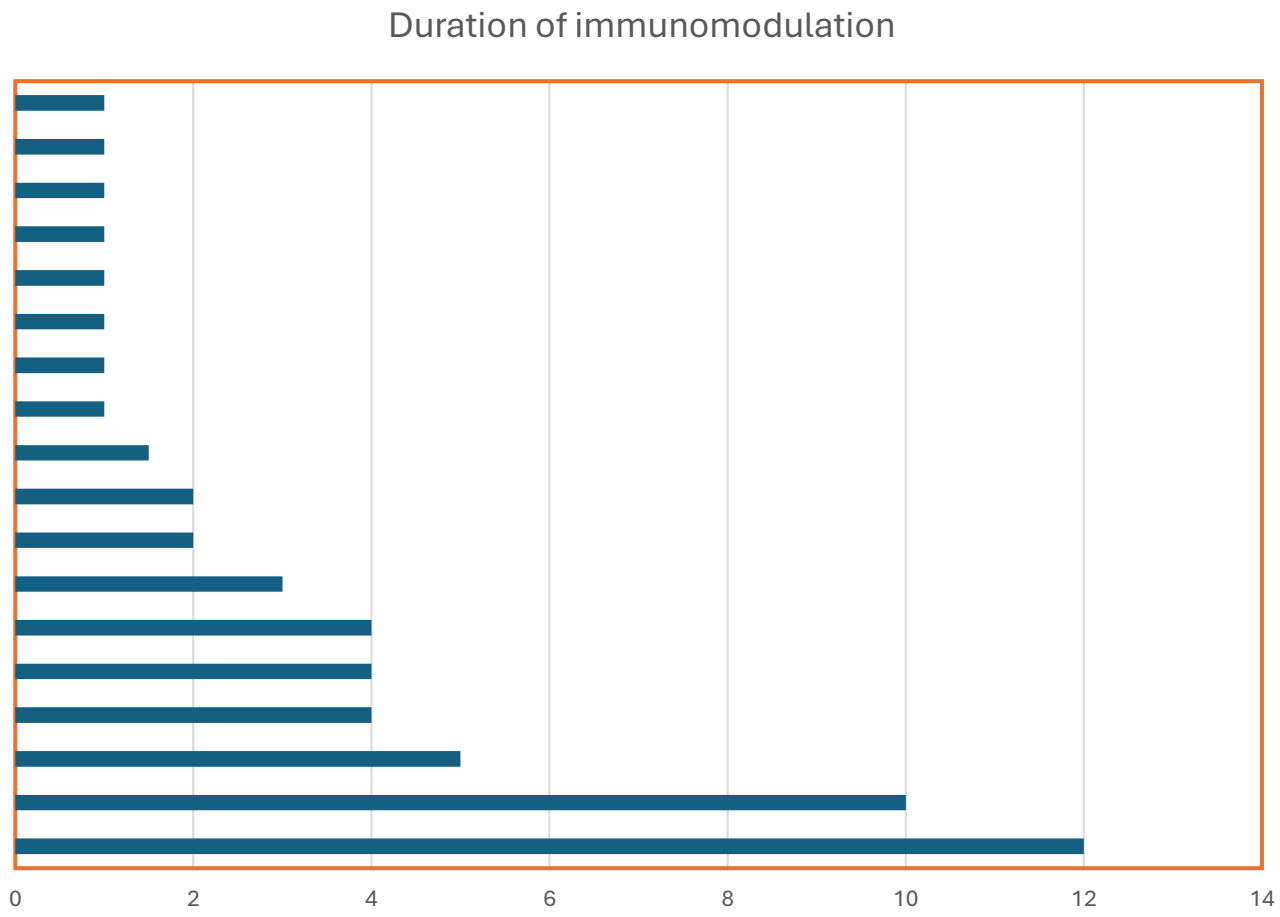
Mycoplasma-5
Mumps-2
EBV-2
Strepto
Strepto
Cox-B
Dengue
Rotavirus
Post Vaccine HPV
F Malaria-2
Scrub typhus
Enterovirus D68
Rotavirus
HHV6
Neuroborreliosis
Cerebellitis
BS encephalitis
Hep C
ASOM

Other findings

- 18 had LP results
- 15 had pleocytosis (Lymphocytic)
- Median cells -41 (13-200)

Treatment

- 10/25- Steroids + IVIG (usually one dose)
- 7- Steroids
- 1- Steroids + Rtx
- 7/25 –no treatment or treatment of infection



Median – 2 months (1.75)

Infection and tumor-negative OMAS

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RESEARCH ARTICLE

WILEY Pediatric Blood & Cancer

SIOP INTERNATIONAL SOCIETY OF PAEDIATRIC ONCOLOGY

aspho The American Society of Pediatric Hematology/Oncology

Multifactorial analysis of opsoclonus-myoclonus syndrome etiology ("Tumor" vs. "No tumor") in a cohort of 356 US children

Michael R. Pranzatelli | Elizabeth D. Tate | Nathan R. McGee

TABLE 1 Cross-sectional comparison of clinical and demographic features of OMS based on tumor detection[a]

Feature	Tumor detected	No tumor detected	*P*
N	173 (49%)	183 (51%)	—
Age at evaluation, years	3.9 ± 3.5	3.7 ± 3.6	0.58
Age at OMS onset, years	1.7 ± 0.89	2.1 ± 1.4	0.17
OMS duration, years	2.3 ± 3.6	1.6 ± 3.1	0.08
OMS duration category, n			0.08
Acute (0–3 months)	31 (19%)	48 (28%)	
Subacute (3–12 months)	57 (35%)	64 (37%)	
Chronic (> 12 months)	73 (45%)	60 (35%)	
TS versus duration category			
Acute	20.7 ± 8.4	20.6 ± 8.3	0.99
Subacute	16.0 ± 8.5	16.6 ±8.1	0.69
Chronic	11.9 ± 7.5	12.8 ± 8.6	0.52
OMS severity (TS)	15 ± 8.7	16.5 ± 8.8	0.52
OMS severity category, n			0.46
Mild (TS 0–12)	64 (40%)	51 (27%)	
Moderate (TS 13–24)	71 (45%)	45 (38%)	
Severe (TS 25–36)	23 (15%)	22 (19%)	

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Michael R. Pranzatelli | Eli:

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Moderate (TS 13–24)	71 (45%)	45 (38%)	
Severe (TS 25–36)	23 (15%)	22 (19%)	
Time to OMS diagnosis (months)	2.1 ± 3.2	3.0 ± 4.5	0.12
Time to diagnosis category, n			0.12
<1 months	51 (57%)	40 (42%)	
1–3 months	22 (24%)	32 (33%)	
3–6 months	12 (13%)	11 (11%)	
6–12 months	5 (6%)	11 (11%)	
>12 months	0	2 (2%)	
Gender, n			0.09
Male	69 (40%)	89 (49%)	
Female	104 (60%)	94 (51%)	
Racial/ethnic demography, n			0.66
White, non-Hispanic	129 (75%)	128 (70%)	
Hispanic/Latino	24 (14%)	27 (15%)	
Black	9 (5%)	15 (8%)	
Asian/Oceanic	1 (0.5%)	4 (2%)	
American Indian	1 (0.5%)	1 (0.5%)	
More than one race	9 (5%)	8 (5%)	
OMS relapse history, n			0.39
Yes	76 (44%)	71 (39%)	
No	97 (57%)	111 (61%)	
Parental age at conception, y			
Mother	28 ± 6	29 ± 6	0.25
Father	31 ± 7	31 ± 6	0.91

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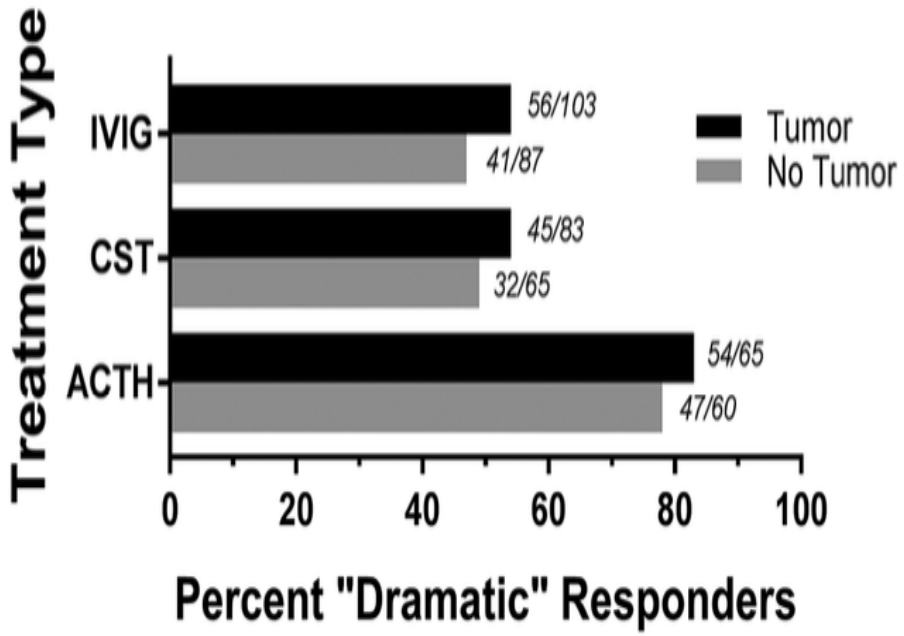
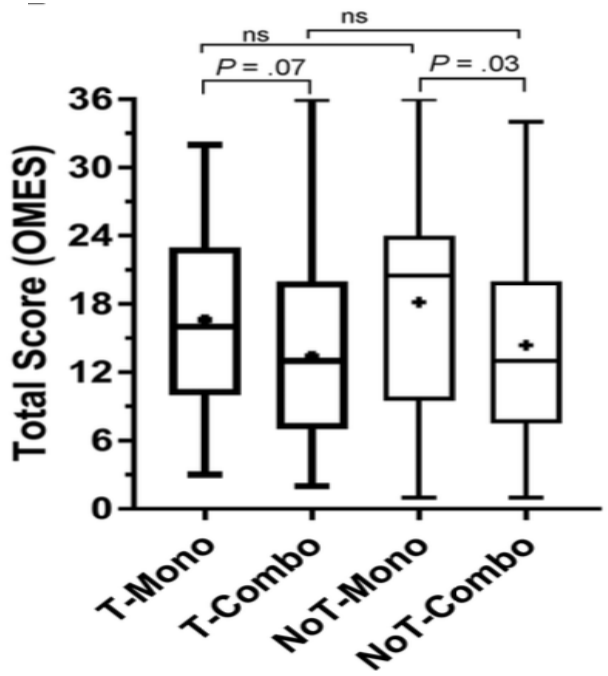
TABLE 2 Cross-sectional comparison of neuroinflammatory markers based on tumor detection in OMS

	CSF			Blood/serum		
Marker	Tumor	No tumor	*P*	Tumor	No tumor	*P*
Leukocytes/cu mm	2.1 ± 2	2.7 ± 3	0.11			
	(92)	*(75)*				
Lymphocyte subsets						
% B cells	3.4 ± 3	4.1 ± 3	0.08	22 ± 11	23 ± 10	0.52
	(144)	*(144)*		*(104)*	*(97)*	
% CD3+ T cells	86 ± 7	84 ± 7	0.04	63 ± 10	63 ± 11	0.97
	(150)	*(142)*		*(105)*	*(97)*	
% CD4+ T cells	47 ± 11	47 ± 12	0.81	34 ± 8	36 ± 10	0.21
	(144)	*(144)*		*(98)*	*(95)*	

COMPARISON OF TREATMENT OUTCOMES IN TUMOR VS NO TUMOR OMAS





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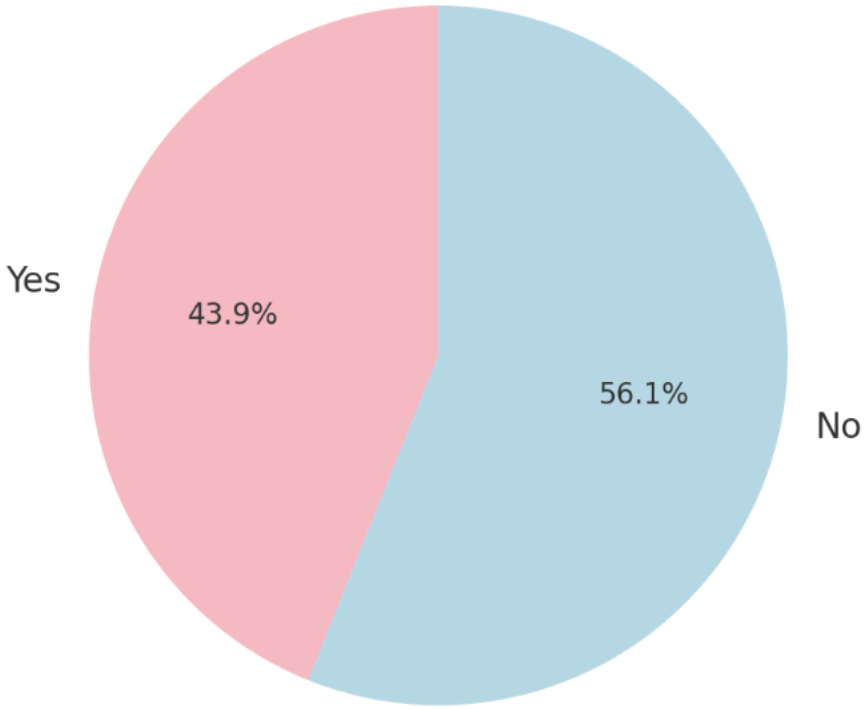
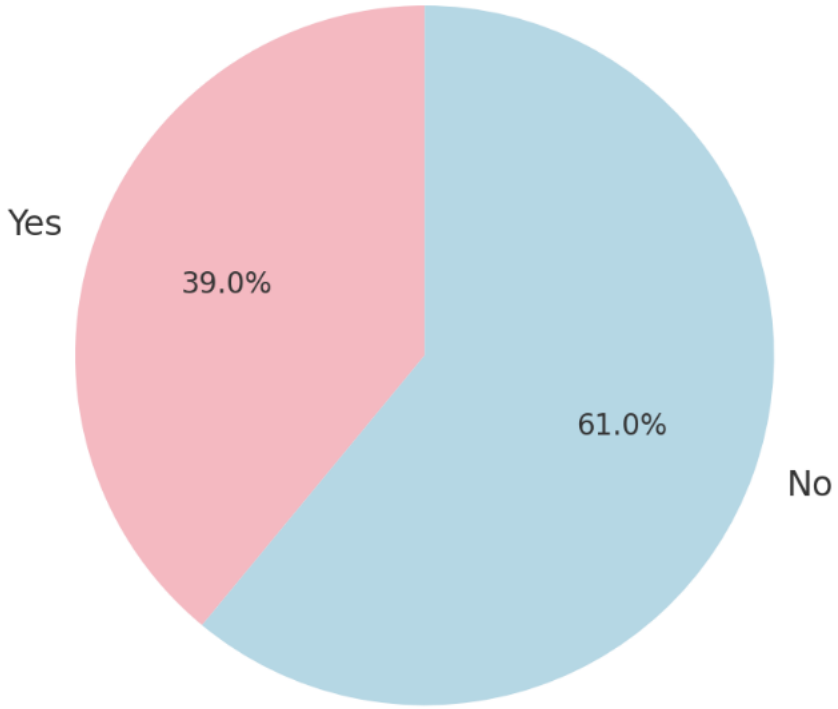
LONG TERM OUTCOMES: RELAPSE



Tumor+



No Tumor

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Conclusions and discussion

Infection-associated versus Infection-triggered

Infection-associated

- Median age- 8 years
- Children 4 or less- Exclude tumor
- CSF pleocytosis

Different Pathophysiology than para-neoplastic OMAS

- Acute immune-mediated or Direct infection
- CSF- pleocytosis may be a clue?/Imaging

Management

- Direct infection: treat infection (+/- immunomodulation)
- Latent period- Immune mediated: Short term immunomodulation

A few more examples

5 month-old
Male
GDD
Multiple seizures per day and spasms
Encephalopathy

SCN2A- DEE with ? Ictal opsoclonus

20 month-old
Male
3rd-degree Consang
GDD
F/B encephalopathy/fever
HIE
At 18 months

Cause ?

15 month-old
GDD
Breast -fed
Abnormal eye and body movements- 20 days

Severe Vitamin B12 deficiency

Infection-
A Retrosp
and Revie

Lokesh Saini,
Renu Suthar,
and Naveen S

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Age/sex	7 y/F	2 y/F	4 y/F	4 y/M	8 m/F	3 y/M
Additional features						
Myoclonus	–	–	+	–	–	+
Ataxia	–	+	+	+	–	+
Irritability	–	–	+	+	+	+
Sleep abnormalities	–	–	+	+	+	+
Encephalopathy	+	+	+	–	+	+
Syndromic diagnosis of OMAS	–	–	+	+	–	+
Duration of fever at presentation (in days)	7	3	14	14 (and a history of viral exanthem at 2 y of age)	60	7
Day of fever when opsoclonus was first noticed	5	3	9	7	55	4
MRI findings	Normal	Normal	Patchy hyperintensities in tegmentum, dentate, central cervical cord, and periventricular white matter	Non specific periventricular hyperintensities	Hydrocephalus, Basal exudates Basal ganglia infarcts	Normal
Serological Evaluation for tropical illnesses and viruses	Scrub Typhus +	Negative for CMV, Scrub typhus, EBV, listeria	Negative for CMV, Scrub typhus, EBV, listeria	Evaluation for CMV, Scrub typhus, EBV, listeria	CSF Gene Xpert positive	Serum Mumps IgM (ELISA) positive
NMO ab, ANA	not done	negative	negative	negative	not done	negative
Cerebrospinal fluid						
Pleocytosis (cells) Hypoglycorrhachia Protein (mg/dL)	Present [30 cells;lymphocytic] no 55	present [201 cells;lymphocytes 93%] no 66	Present [200 cells; lymphocytes 70%] no 45	Absent no 29	present [280 cells; 85%polymorphonuclear cells] yes 121	present [120 cells; 90% lymphocytes] yes 59
Evaluation for tumor	negative	negative	negative	negative	negative	negative
Treatment received						
Antibiotics Antivirals Immunomodulation	Doxycycline – –	Azithromycin, Ampicillin – –	Azithromycin, Ampicillin Acyclovir Pulse steroids, IVIg	– – Pulse steroids	Anti-tubercular therapy – Dexamethasone	Empiric Azithromycin – Pulse steroids, IVIg
Duration of follow-up (in months)	12	6	3	4	2	2
Time to Resolution of opsoclonus, myoclonus and ataxia	7 d	7 d	Partial response- 7 d, complete response 1 mo	10 d	3 d	Partial response- 7 d, complete response 2 wk
Neurologic status at last follow-up	Normal	Normal	Significant improvement in opsoclonus, irritability, Needs support for activities of daily living	Normal	Disability: hemiparesis, dystonia, no opsoclonus	Normal
Diagnosis	Scrub meningoencephalitis	Probable acute cerebellitis	Probable brainstem encephalitis	Subacute sclerosing pan-encephalitis	Tubercular meningitis	Mumps encephalitis

Thank you