

Defining Pediatric NMOSD in Brazil: A Large Cohort Analysis from the NMO-RG Database

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INTRODUCTION

Neuromyelitis optica spectrum disorder (NMOSD) is a rare disease that may present at any age. Many studies have shown that pediatric- and adult-onset NMOSD differ in clinical presentation, diagnosis, and treatment. Here, we describe the demographic and clinical features of a large cohort of pediatric-onset NMOSD cohort in Brazil drawn from the NMO-RG Registry.

MATERIALS AND METHODS

We collected data on Brazilian NMOSD patients registered in the NMO-RG by November 30, 2024. Patients were categorized by age at disease onset into pediatric- (≤ 18 years) and adult groups. All cases met the 2015 International Diagnostic Criteria for NMOSD. The demographic and clinical characteristics were compared between pediatric- and adult-onset disease.

RESULTS

Of the 872 registered patients 111 (12.7%) had pediatric-onset disease, with AQP4-antibody seropositivity of 77.7%. Mean age at onset was 33.8 ± 14.5 ; 80.9% were female; 43.7% Caucasian, 41.7% Mixed, 13.6% Black, and 1.0% Asian. Optic neuritis (46.8%) and myelitis (45%) were the most common presenting symptoms. Compared with adults, pediatric NMOSD more frequently showed area postrema syndrome (26%, $p=0.003$), brainstem symptoms (16.5%, $p=0.013$), and cerebral symptoms (5.5%, $p=0.019$), but had fewer general symptoms (47.1%, $p=0.003$), particularly pain (20.7%, $p<0.001$). Annualized relapse rates, EDSS scores, AQP4-antibody positivity, and CSF-restricted oligoclonal bands did not differ significantly between pediatric- and adult-onset disease.

CONCLUSION

This study describes one of the largest pediatric NMOSD cohorts worldwide. Our findings underscore the higher frequency of pediatric NMOSD in Brazil, and key clinical differences between pediatric- and adult-onset disease, especially regarding presenting symptoms and the higher prevalence of area postrema, brainstem, and cerebral syndromes in children. These observations may guide earlier recognition, diagnosis, and management of pediatric NMOSD. Further multicenter studies are warranted to clarify long-term outcomes and the pathophysiological mechanisms underlying these age-related differences.

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Table. Neuromyelitis optica spectrum disorders in the pediatric and adult groups

	Total n=865/872	Age groups		P
		≤ 18 n=111	>18 yr n=754	
Age at onset, yr*				
Median [IQR]	33.0	13.0	35.5	<0.001
Range	[23.0-43.0]	[9.0-15.0]	[27.0-45.0]	
Mean $\pm$ SD	1.0-79.0	1-18	19-79	
	33.8 $\pm$ 14.4	12.0 $\pm$ 3.9	37.0 $\pm$ 12.5	
Female gender, no./total no. (%)	735/866 (84.9)	89/110 (80.9)	640/749 (85.4)	NS
Ethnicity, no./total no. (%)				NS
Caucasian	328/764 (42.9)	45/103 (43.7)	279/656 (42.5)	
Mixed	282/764 (36.9)	43/103 (41.7)	239/656 (36.4)	
African descent	143/764 (18.7)	14/103 (13.6)	128/656 (19.5)	
Asian/Other	11/764 (1.4)	1/103 (1.0)	10/656 (1.5)	
Presenting symptoms, no./total no. (%)				
Optic neuritis (ON)	419/861 (48.7)	51/109 (46.8)	368/752 (48.9)	NS
Myelitis (MY)	427/861 (49.6)	49/109 (45.0)	378/752 (50.3)	NS
Area postrema syndrome (APS)	140/861 (16.3)	29/109 (26.6)	111/752 (14.8)	0.003
Brainstem (BS)	82/861 (9.5)	18/109 (16.5)	64/752 (8.5)	0.013
Diencephalon	8/861 (0.9)	3/109 (2.8)	5/752 (0.7)	0.069
Cerebral	18/861 (2.1)	6/109 (5.5)	12/752 (1.6)	0.019
Optic neuritis and myelitis	94/861 (10.9)	10/109 (9.2)	84/752 (11.2)	NS
Exclusive ON+MY	68/861 (7.9)	4/109 (3.7)	64/752 (8.5)	0.088
Exclusive ON	294/861 (34.1)	32/109 (29.4)	262/752 (34.8)	NS
Exclusive MY	290/861 (33.7)	30/109 (27.5)	260/752 (34.6)	NS
Exclusive APS	52/861 (6.0)	10/109 (9.2)	42/752 (5.6)	NS
Exclusive BS	29/861 (3.4)	4/109 (3.7)	25/752 (3.3)	NS
General Symptoms, no./total no. (%)				
No general symptoms	286/751 (38.1)	46/87 (52.9)	240/664 (36.1)	0.003
Pain	302/751 (40.2)	18/87 (20.7)	284/664 (42.8)	<0.001
Pruritus	23/751 (3.1)	1/87 (1.1)	22/664 (3.3)	NS
Fatigue	134/751 (17.8)	11/87 (12.6)	123/664 (18.5)	NS
Anxiety/depression	206/751 (27.4)	21/87 (24.1)	185/664 (27.9)	NS
Cognitive symptoms	43/751 (5.7)	5/87 (5.7)	38/664 (5.7)	NS
Annual relapse rate, relapses/yr	n=862	n=111	n=751	NS
Median [IQR]	0.40	0.45	0.39	
Range	[0.19 – 0.80]	[0.22 – 1.00]	[0.19 – 0.77]	
Mean $\pm$ SD	0.00 – 10.00	0.00 – 4.36	0 – 10.00	
EDSS at last visit	0.79 $\pm$ 1.20	0.72 $\pm$ 0.79	0.80 $\pm$ 1.25	
Median [IQR]	n=830	n=106	n=724	NS
Range	4.00	4.00	4.00	
Mean $\pm$ SD	[3.00 – 6.50]	[2.88 – 6.50]	[3.00 – 6.50]	
	0.00 – 10.00	0.00 – 10.00	0.00 – 10.00	
	4.59 $\pm$ 2.40	4.46 $\pm$ 2.33	4.60 $\pm$ 2.41	
AQP4-Ab positivity, no./total no. (%)	637/824 (73.1)	80/103 (77.7)	550/714 (77.0)	NS
OCB/high IgG index, no./total no. (%)	70/478 (14.6)	10/61 (16.4)	60/416 (14.4)	NS
Disease duration (months)	n=865	n=111	n=754	0.015
Median [IQR]	79.0	104	75.5	
Range	[31.5 – 153.0]	[47.0 – 170.0]	[28.1 – 149.0]	
Mean $\pm$ SD	1.0 – 639.0	3.4 – 637.0	1.0 – 639.0	
	105.6 $\pm$ 98.8	126.0 $\pm$ 113.0	102.6 $\pm$ 96.2	