Commentary

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# Epidemiological Heterogeneity of Multiple Sclerosis and Acquired Demyelinating Syndrome in Children

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## Abstract

Heterogeneity represents a keyword in most epidemiological studies on Pediatric Multiple Sclerosis (PMS). In fact, depending on study results, the Pediatric Multiple Sclerosis (PMS) annual incidence varies from 0.15 up to 3 per 100000 children, the female to male ratio from 1.2 up to 4.5 and the percentage of pediatric-onset compared to adult-onset (MS) ranges from 1.6 up to 9.5%. In particular, Pediatric Multiple Sclerosis (PMS) represents one of the future outcomes of an Acquired Demyelinating Syndrome (ADS) among children none the less; its proportion at Acquired Demyelinating Syndrome (ADS) onset is also a matter of debate.

**Keywords:** Heterogeneity; Pediatric Multiple Sclerosis; Acquired Demyelinating Syndrome

## About the Study

We recently reported that Pediatric Multiple Sclerosis (PMS) is diagnosed in the 72% of Acquired Demyelinating Syndrome (ADS) cases in the pediatric population of Northen Sardinian [1,2]. Almost simultaneously and in the same journal, a UK study found that Pediatric Multiple Sclerosis (PMS) is diagnosed in 19.2% of Acquired Demyelinating Syndrome (ADS) children [3,4]. We would shortly comment on similarities and divergences in the attempt to explain the epidemiological heterogeneity between the two studies. As for similarities, male and female proportions do not substantially differed and, to identify eligible participants, the same Pediatric Multiple Sclerosis (PMS) criteria were used in both studies [5]. However, differences were present which could have had a strong impact on the prevalence rates.

First of all, the sample size, we calculated our frequency on a total 44 eligible participants with ADS3, while the UK study recruited 125 Acquired Demyelinating Syndrome (ADS) subjects [4]. Second, the different age across studies. In our case the median age of the pediatric population was 16 years [3], while it was 10 years in the UK study [4]. Third, the length of the follow-up periods: 8.5-year [3] versus 10-year [4] mean duration. Other important reasons have to be searched in the retrospective [3] versus prospective nature of data collection, which could have also affected the proportion of Pediatric Multiple Scleroses (PMS) diagnosed over the two Acquired Demyelinating Syndrome (ADS) series. In fact, diagnosis of NMOSD and MOGAD disorders in our series [3] were often made retrospectively, with diagnostic criteria that were not yet available at Acquired Demyelinating Syndrome (ADS) onset.

Finally, the UK study has been conducted in a multi-ethnic population [4], while our study reported results only for patients of Sardinian descent [3]. It is worth highlighting that Sardinia is an Italian island with a unique genetic composition, a negligible immigration rate and a very high burden of several autoimmune diseases, including MS in adults and children [3,6,7]. In some, according with a recent authoritative commentary on the complex epidemiology of ADS in children [8], the inconsistencies between different epidemiological findings could represent an opportunity to further clarify predisposing genetic, environmental and epigenetic factors of both Pediatric Multiple Sclerosis (PMS) and Acquired Demyelinating Syndrome (ADS) in different populations [2].

## Conclusion

Acquired Demyelinating Syndrome (ADS) among children gives us a unique opportunity to investigate on MS etiology given the short interval from predisposing events and disease onset. This can contribute to an earlier diagnosis of MS and to a more tailored, individual-based MS treatment already in the developmental age.

## Conflict of Interest

None

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