Pediatric onset multiple sclerosis: study of a Tunisian cohort

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INTRODUCTION

- Multiple sclerosis (MS): an autoimmune and neurodegenerative disease of the central nervous system (CNS)
- Pediatric onset multiple sclerosis (POMS): 10% of the cases
- Several clinical features distinguish POMS from adult-onset MS (AOMS) including disease activity and clinical course
- Our aim is to study the characteristics of a Tunisian POMS cohort.

METHODS

- Retrospective study held in the department of pediatric neurology over a period of 14 years [2009-2022]
- All children diagnosed with POMS (MacDonald 2017 criteria) were included
- Clinical, radiological presentation as well as evolution were analyzed with IBM SPSS statistic 21
- Annualized relapse rate (ARR) defined by the number of relapses during a specific period of time divided by disease duration (years) was calculated for all patients
- Progression Index (IP) was calculated for all patients using the Expanded Disability Status Scale (EDSS) divided by disease duration
- Correlations with demographic, clinical and radiological features were analyzed

RESULTS

- Fifty patients included
- Mean age of onset: 13,5 years [4-17,5]
- Clinical form at diagnosis: Relapsing remitting in 48 patients and secondary progressive in 2 patients
- First attack: monosymptomatic in 68%, predominance of brainstem attacks (18%) **[Figure 1]**
- At follow up: motor attacks (50%) **[Figure 2]**

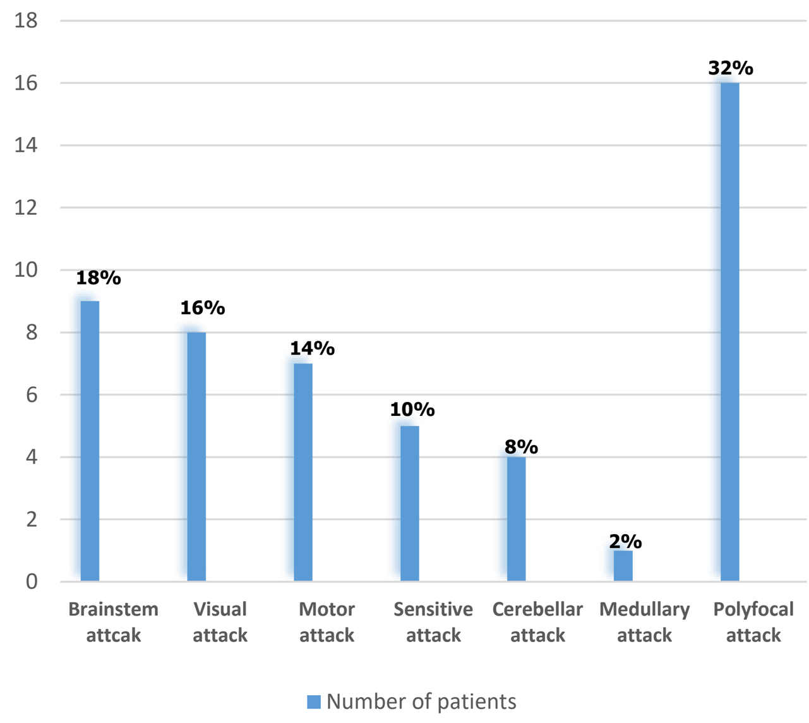

Figure 1. Type of the first attack

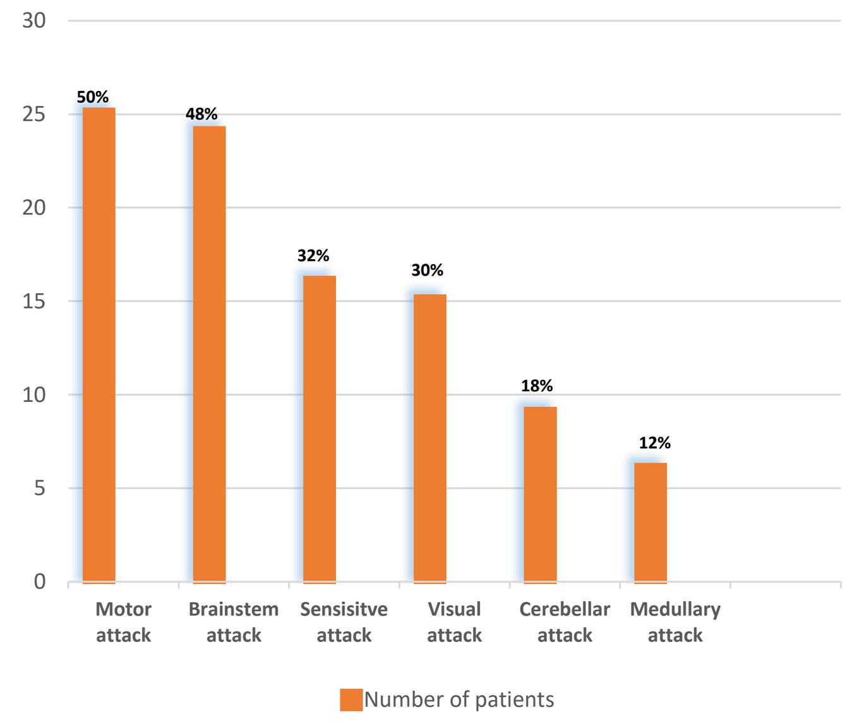

Figure 2. Type of attacks at follow up

- Disease modifying treatments (DMTs) were given to 40 patients
- Mean ARR (relapses/year) was 1,3 [0,2-4] before DMT initiation and 0,64 [0-3] at last consultation after DMT
- ARR was correlated with age of disease onset (p=0,011), duration between first and second attack (p=0,013), motor attacks (p=0,042) **[Table 1]**, DMT use (p<0,01) and time to initiation of DMT (p=0,04) **[Figure3]**
- No correlations were found between ARR and location of MRI lesions

RESULTS

Table 1. ARR correlation with type of attacks

Type of attacks	OR CI 95%	p
Motor	0,572 [0,023 – 1,122]	**0,042**
Cerebellar	0,133 [- 0,766 – 1,033]	0,766
Medullary	-0,506 [-1,317 – 0,304]	0,214
Brainstem	0,394 [-0,413 – 1,201]	0,329
Sensitive	-0,201 [-0,875 – 0,474]	0,551
Visual	0,690 [-0,032 – 1,411]	0,06

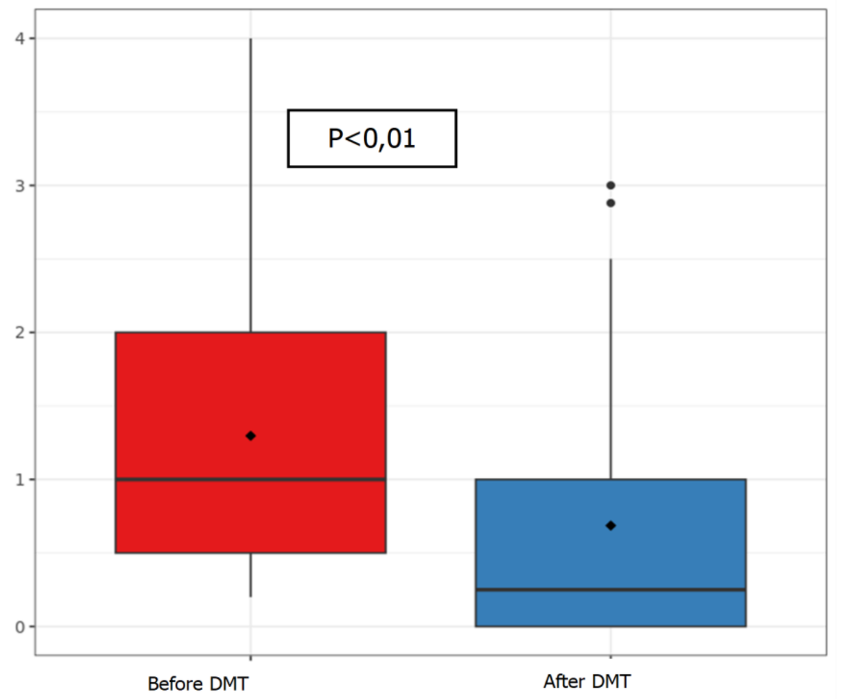

Figure 3. ARR distribution before and after DMT

- Mean Progression index (IP) was 0,54 [0-2,5] before first line treatment and 0,43 [0-2,75] at last consultation
- IP was correlated with brainstem attacks (p=0,033) **[Table 2]**, contrast enhancement on cerebrospinal MRI (p= 0,035) and poor recovery from first attack (p=0,048)

Table 2. IP correlation with type of attacks

Type of attacks	OR CI 95%	P
Motor	0,246 [-0,101 – 0,452]	0,206
Cerebellar	0,329 [0,138 – 0,795]	0,161
Medullary	- 0,06 [-0,387 – 0,376]	0,976
Brainstem	0,430 [-1,036 – 0,825]	**0,033**
Sensitive	- 0,083 [-0,402 – 0,235]	0,602
Visual	- 0,920 [-0,448 – 0,263]	0,602

DISCUSSION

- A duration of less than 1 year between the first and second attack is correlated with a higher ARR in our cohort in our cohort and in literature
- The occurrence of motor relapses was correlated with a higher ARR in our cohort, while with brainstem relapses in the study of Boiko and al.
- DMT use and time to DMT initiation drastically decrease ARR as reported in literature
- IP: a dynamic prognostic marker used to assess disease progression
- Correlation with brainstem attacks, poor recovery from first attack and contrast enhancement on MRI were found in our study as previously reported in literature

CONCLUSION

In our cohort, age of onset and duration between first and second attacks were clinical markers of a higher disease activity. Use of DMTs and their early initiation were correlated with a decrease in ARR. Progression index was found correlated with brainstem attacks and MRI contrast enhancement. These prognostic markers of disease activity and progression are important to identify to adapt treatment strategies and prevent handicap accumulation for fast progressors

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