Cognitive Impairment in Patients with Immune Thrombocytopenia

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INTRODUCTION

- Immune thrombocytopenia (ITP) is an autoimmune condition characterised by a low platelet count (<100 x 10^9/L).
- In a previous study we showed that 43% of adult patients with ITP have occult cerebral microbleeds (CMBs) and noticed an increased incidence of white matter hyperintensities (WMH)[1].
- Some studies have shown CMBs are associated with cognitive impairment[2,3].
- Some patients with ITP also suffer from fatigue, memory and concentration problems[4].
- These symptoms are suggestive of cognitive impairment.

AIMS

Primary

- Establish what percentage of patients with ITP suffer from cognitive impairment and which cognitive domains are impaired.

Secondary

- Investigate whether disease parameters and MRI findings are associated with cognitive impairment in patients with ITP.

METHODS

Patients with ITP who attended the ITP centre at Hammersmith Hospital, London, and who had a nadir platelet count ≤ 30 x 10^9/L at any time during their disease course were recruited to the study.

Study procedures

- Susceptibility Weighted Magnetic Resonance Imaging (SW-MRI) of the brain to detect CMBs and Fluid-Attenuated Inversion Recovery (FLAIR) at 3T MRI for white matter hyperintensity (WMH) assessment.
- CMBs and WMHs were counted on SWI and FLAIR images, respectively. Additionally, each patient was given a Fazekas score (0-3, ranging from none to severe hyperintensities) based on the severity of WMHs.
- Cognition was assessed using CANTAB Insight (Figure 1).
- Five key cognitive domains (working memory, executive function, processing speed, attention and episodic memory) were assessed using different tasks.

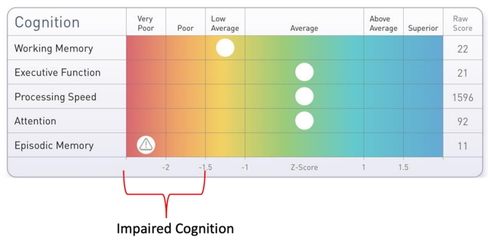

Figure 1. Example of CANTAB generated report. Z-scores standardized for age, sex and education level were generated. Based on the z-score, the patient's cognitive performance was categorized as impaired (z-score<-1.5) or not impaired (z-score>-1.5).

RESULTS

Study Sample

- Sixty-eight patients were recruited consecutively from Hammersmith Hospital, London.
- Demographics and MRI findings are presented in Tables 1 and 2.

Table 1. Demographics and clinical characteristics of the population studied.

N= 68	Median (range)
Age at the time of cognitive test, years	40 (19, 88)
Age at the time of ITP diagnosis, years	31 (4, 83)
Female, n (%)	44 (65)
Duration of disease at the time of cognitive testing, months	67.5 (5, 535)
Nadir platelet count, x 10^9/L	5 (0, 30)
Number of ITP treatment types received	4 (0, 14)
Platelet count at the time of cognitive test, x 10^9/L	95 (4, 653)
Patients receiving ITP treatment at the time of cognitive test, n (%)	34 (50)
Patients with co-morbidities, n (%)	45 (66)
Patients with hypertension, n (%)	3 (4)
Patients with diabetes, n (%)	4 (6)
Patient with cardiovascular disease, n (%)	4 (6)
Antiplatelet/anticoagulant agents, n (%)	9 (13)

Table 2. MRI findings of the population studied.

Number of CMBs				
	0	1	2-4	5-10
n (%)	46 (68)	7(10)	11(16)	4(6)
Number of WMHs				
	0-1	2-5	6-10	10+
n (%)	38 (56)	8 (12)	9 (13)	13 (19)
Fazekas Score				
		0	1	2
n (%)		38 (56)	23 (34)	7 (10)

Cognition

- Of the 68 patients tested, 33 patients (48.5% (95 % CI [36%, 60%]) had at least one impaired cognitive domain (Figure 2).
- Episodic memory was the most commonly impaired domain, with 15/66 patients showing impairment in that domain (two patients did not complete the test).
- 12/68 patients had impaired executive function; 11/68 patients had impaired processing speed; 8/68 had impaired working memory; 2/68 patients had impaired attention (Figure 3).
- There were no statistically significant differences found between the ITP disease parameters (including platelet count, duration of disease, SMOG score, number of ITP treatments received) of patients with impaired cognition and those of patients without impairment.
- Receiving ITP treatment at the time of the cognitive test, or having co-morbidities did not show an association with impaired cognition.
- There was no statistically significant association between the presence (OR=0.70, p=0.51) and number of CMBs (OR=0.97, p=0.83) and impaired cognition.
- The number of WMHs was not significantly associated with impaired cognition (OR=1.06, p=0.19), Fazekas score 1 (OR=2.02, p=0.23) and Fazekas score 2 (OR=8.57, p=0.07) were not significantly associated with impaired cognition, although there was a trend for increased cognitive impairment in patients with Fazekas score 2.

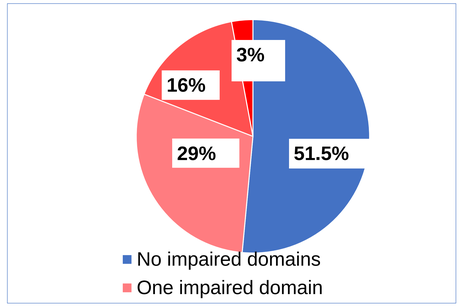

Figure 2. Percentage of patients with one, two and three impaired cognitive domains.

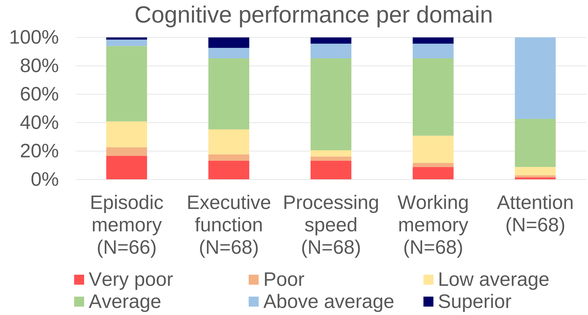

Figure 3. Percentages of patients with cognitive impairment per domain.

CONCLUSIONS

- In this study we showed that almost 50% of patients with ITP suffer from cognitive impairment. The findings of our study align with and expand upon recent research on cognitive impairment in ITP[5].
- Perhaps surprisingly, there was no association between presence or number of CMBs and cognitive impairment.
- This is the first time WMHs have been reported in patients with ITP. Association between WMHs and impaired cognition requires further investigation in a larger cohort.

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