Frontal lobe and insight

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Introduction

Poor Insight is usually found in up to 80 % of Schizophrenia patients. It has important treatment and prognostic implications (1). Poor insight is considered to be related to frontal lobe cognitive dysfunction, but there is no consensus about its specifity (2,3). The study aims to show a relationship between level of insight and neuropsychological function. We hypothetized that patients with lower insight will show frontal dysfunction as indicated by relative deficits in strategic vs. associative memory and in executive vs. non-frontal tasks.

Methods

43 DSM-IV schizophrenia or schizoaffective patients were assessed (Table 1). Clinical psychopathology instruments included PANSS and SUMD (Scale to Assess Unawareness of Mental Disorder). Neuropsychological testing assessed IQ, strategic and associative memory (using Moscovitch explicit memory model), executive functioning, information processing speed and visuo-spatial ability (4,5,6). The Spearman rank-order correlations were calculated between measures of neuropsychological function and insight. Then, patients were divided in two groups according to SUMD scores: 'insight' (<3) and 'no insight' (=/> 3) and the Mann-Whitney U was used to assess group differences in neuropsychological test scores.

Table 1: Sociodemographic and clinical characteristics (n=43).

	N	Median (SD)	Range
Age in years		34.9 (8.5)	[20_54]
Gender			
Male	28		
Female	15		
Years of education		10 (2.2)	[8_17]
DSM IV Diagnosis			
Schizophrenia disorder	34		
Schizoaffective disorder	9		
Duration of illness		10.3 (8.7)	[0.1_30.6]
Nº hospitalitations (lifetime)		2 (3)	[0_15]
PANSS			
Positive		19 (7.2)	[7_33]
Negative		16.9 (9)	[7_40]
General		33.6 (8.7)	[18_57]
Total		69.6 (19.9)	[37_123]

Results

The neuropsychological performance of the patient group did not show a high level of impairment. However, relative deficits appeared in processes associated with executive functions and memory (Table 2). Regarding awareness of disease, although only 20% of patients had low levels of insight as measured by the SUMD total score, 41% of patients had insight deficits on subdomains including awareness of suffering from a mental disorder and awareness of its social consequences (Table 3). We found no significant correlation between SUMD total score and cognitive variables. There was a relationship between the different SUMD dimension measures and temporary memory (TO), prospective memory, cognitive set-shifting (WCST), and WAIS-III block design. Additionally, no relationship was found between insight dimensions and non-frontal measures. Patients showing lower insight had significantly poorer performance on frontally relevant executive and memory tasks (Table 4).

Table 2: Neuropsychological status (n=43).

	Mean (SD)	Range	% deteriorated (-1.5 SD)
ESTIMATION OF PREMORBID INTELIGENCE			
Vocabulary (WAIS-III)	40.8 (8)	[26-57]	3.8
STRATEGIC MEMORY			
Temporal Ordering (TO)	22 (.49)	[-.6 / .9]	34.9
Self-ordered pointing (SOPT). Span verbal (0-32)	9.4 (2.8)	[3-14]	_
Self-ordered pointing. Total errors (0-30)	5.6 (2.1)	[1-10]	18.6
Long -term free recall (TAVEC)	7.6 (3.5)	[0-14]	62.7
ASSOCIATIVE MEMORY			
Associated pairs (WMS-R). Learning	14.2 (5.3)	[4-23]	_
Acknowlegement - Discriminability Index (TAVEC)	88.4 (9.6)	[59-100]	30.2
Long-term retention Index (TAVEC)	-.45 (26.5)	[_50 / 75]	23.2
FRONTAL LOBE (executive function)			
WCST-64. Perseverative Errors	15.4 (11.8)	[2-49]	20.9
WCST-64. Categories obteined (0-6)	2.3 (1.5)	[0-6]	27.9
PM.Prospective Memory. Time-based. Correct	.74 (1)	[0-4]	_
PM.Prospective Memoriy Event-based. Correct (0-6)	3.8 (2.3)	[0-6]	_
Letters and Numbers (WAIS-III)	7.3 (3.2)	[1-17]	30
Inverted Digits (WAIS-III) (0-14)	4.7 (2.4)	[0-14]	_
Trail Making Test B. Time in seconds	140.4 (71.4)	[44-360]	74.4
STROOP word-color	32.6 (9.9)	[9-52]	34.9
PARIETAL LOBE (visuo-spatial ability)			
Judgment of Line Orientation (Short Form Q) (0-30)	23 (5.4)	[7-30]	20.9
Block Design (WAIS-III)	33.1 (12.1)	[5-56]	20.5
Right-Left Orientation Test	18.3 (2.5)	[12-20]	18.6
CONTROL MEASURES			
Trail Making Test A. Time in seconds	43.5 (21.3)	[17-143]	37.2
Direct Digits (WAIS-III)	7.5 (1.7)	[4-11]	_
Digit symbol (WAIS-III)	50.4 (17.7)	[13-87]	28.2
STROOP Words	91 (16.5)	[49-125]	18.6

Table 3: SUMD dimensions (n=43).

		Mean (SD)	Range	% patients no insight (=> 3)
SUMD1	Unawareness mental disorder	2.3 (1.3)	[1-5]	41.9
SUMD2	Unawareness medication	2.1 (1.1)	[1-5]	30.2
SUMD3	Unawareness social consequences	2.2 (1.2)	[1-5]	41.9
SUMD S	Symptom Unawareness	2.3 (.9)	[1-4.5]	18.6
SUMD AT	Symptom Misattribution	2.6 (1)	[1-5]	25.6
SUMD TOTAL		2.2 (0.9)	[1-4.5]	20.9

SUMD rate (1-insight, 3-partial insight, 5-no insight)

Taula 4: Correlation between neuropsychological variables and insight (n=43).

	Insight dimension	rho[3]	U Mann_Whitney
STRATEGIC MEMORY			
Temporal Ordering (TO)	SUMD AT	-.13 (.38)	-2 (.04)*
FRONTAL LOBE (executive function)			
WCST-64. Categories obtained	SUMD 3	-.22 (.14)	-2.1 (.03)*
WCST-64. Perseverative error	SUMD S	.09 (.52)	-1.9 (.04)*
PM. Time-based	SUMD 3	-.31 (.04)*	-1.71 (.08)
PM. Time-based	SUMD S	-.3 (.04)*	-.53 (.59)
PM. Event-based	SUMD AT	-.27 (.07)	-3.05 (.002)*
Trail Making Test B	SUMD 3	.28 (.06)	-1.2 (.2)
PARIETAL LOBE (visuo-spatial ability)			
Block Design	SUMD 3	-.35 (.02)*	-1.75 (.079)

*** p< .001; * p < .05*
[3]Spearman rank-order correlation

Discussion

These preliminary results suggest a specific association between lack of insight and frontal lobe dysfunction. The association identified with one of the parietal measures - block design - could be due to the high level of planning required by the task. However, the study results could have been affected by the good level of insight of the sample.

References

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AKNOWLEDGEMENT: To Jose Maria Manresa (IMIM) for his statistical assistance.

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