MOTOR AND COGNITIVE ABNORMALITIES IN SCHIZOPHRENIA

HOPULELE-PETRI A, MANEA M.[1]
1. "CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY, BUCHREST, ROMANIA

BACKGROUND AIMS: Motor abnormalities have been signaled in schizophrenia (Peralta et al. 2010, Walther & Strik 2012), from neurological soft signs (NSS) (Sewel et. Al. 2010), to bradykinesia (Morrens, 2007), with the former even suggested as an endophenotypic marker (Chan et. Al 2010). Cognitive rigidity, demonstrated in cognitively perseverant schizophrenic patients, has also been found in other neurological, dopaminergic disorders, like Parkinson's (Cools et. Al. 2001), a disease whose symptoms share some overlap with the negative symptoms in schizophrenia (Winograd-Gurvich 2006).
The Aims of our current study consisted of evaluating the relationship between motor symptoms, cognitive flexibility and clinical symptoms in a patient population.

METHOD: Inclusion criteria represented a diagnosis of schizophrenia according to DSM-V criteria, while exclusion criteria consisted of any neurological disorder aside from neuroleptic-induced parkinsonism (i.g. stroke). **Neurological soft signs** (NSS) were assessed using the Brief Motor scale (BMS). **Motor speed** and **imagery** were assessed using the TimeUpAndGo! Task, and the imaginary version (iTUG) version (the version by Beauchet et al 2010). Cognitive flexibility was measured using a **set-shifting paradigm**, which was assessed using a computerized short-form version of the Berg Card Sorting test (Berg Card Sorting Test 64).

Anticholinergic burden of medication was assessed using the ABC method by Gorup et. Al (2018), while **neuroleptic burden** was assessed using the Daily Dose Method (DDD) by Leucht (2016).
Epidemiological data regarding age, age of onset, duration of illness was also recorded.

N=28	Minimum	Maximum	Mean	Std. Deviation
Age	19.0	56.0	35.917	11.7322
Age of Onset (years)	17	49	26.46	7.384
Duration of Illness (years)	.0	31.0	9.870	10.4547
Chlorpromazine Eq (DDD)	180.0	1380.0	579.354	279.4335
Anticholinergic Burden (ACB)	1.0	7.0	2.737	1.5218

Table 1. Descriptive statistics

RESULTS

	SAS	MOCO	MOSE	BMST	TUG	ITUG	TUGd
5 Factor Model Positive Symptoms	-.056 .783 27	-.022 .912 27	.161 .424 27	.068 .736 27	.108 .632 22	-.504 .017 22	.433 .044 22
5 Factor Model Negative Symptoms	-.182 .363 27	.518 .006 27	.415 .031 27	.531 .004 27	-.011 .962 22	-.090 .689 22	.292 .187 22
5 Factor Model Disorganisation Symptoms	.304 .123 27	.555 .003 27	.620 .001 27	.661 .000 27	.190 .397 22	.038 .867 22	.306 .166 22
5 Factor Model Depression Symptoms	-.316 .109 27	.014 .944 27	.037 .854 27	.038 .850 27	.029 .897 22	.041 .856 22	.156 .489 22
5 Factor Model Excitability Symptoms	-.046 .820 27	.088 .661 27	.086 .670 27	.102 .612 27	.111 .623 22	-.448 .037 22	.624 .002 22

Table 2. Relationship between clinical symptoms, NSS and motor speed

As seen in Table 1, statistically significant results at the .01 level were found between negative symptoms and **motor coordination** (MOCO, r=.51) as well as **total BMS** score (BMST, r=.51). Meanwhile, Disorganization symptoms were significantly and moderately corelated with both **coordination** (MOCO, r=.55) and **sequencing** (MOSE, r=.62) as well as total score. Interestingly, positive symptoms were corelated only with the **imaginary Time Up and Go!** Task (iTUG, r=-50), while excitability symptoms with delta TUG time (the difference between TUG and iTUG time, in milliseconds, r=.62, p<.01)

As seen in Table 2, out of all symptom domains, only **negative symptoms** were correlated with all performancea measures at the BCST-64, with correlations in expected directions (negative for positive results, positive for negative results i.e. errors).

	CorrectT	ErrorT	PRt	PEt	NPEt	UEt	T2C1c	CLR	CLR%
5 Factor Model Positive Symptoms	-.153 .447 27	.153 .447 27	.115 .568 27	.245 .218 27	-.014 .944 27	.012 .953 27	-.049 .808 27	-.202 .312 27	-.212 .289 27
5 Factor Model Negative Symptoms	-.607 .001 27	.607 .001 27	-.545 .003 27	-.459 .016 27	.612 .001 27	.761 .000 27	-.439 .022 27	-.582 .001 27	-.614 .001 27
5 Factor Model Disorganisation Symptoms	-.486 .010 27	.486 .010 27	-.388 .045 27	-.244 .219 27	.432 .024 27	.215 .281 27	-.248 .212 27	-.505 .007 27	-.547 .003 27
5 Factor Model Depression Symptoms	-.093 .645 27	.093 .645 27	-.254 .202 27	-.286 .148 27	.194 .332 27	.184 .357 27	.031 .880 27	-.067 .740 27	-.076 .705 27
5 Factor Model Excitability Symptoms	-.010 .961 27	.010 .961 27	.190 .342 27	.268 .176 27	-.118 .556 27	-.123 .543 27	.151 .451 27	-.028 .891 27	-.037 .856 27

Table. 3 Relationship between clinical symptoms and set-shifting

Correlation analyses was also performed between **neuroleptic and anticholinergic burden and motor symptoms**, with no significant results discovered. In our sample, anticholinergic burden was also not associated with impaired performance on the BCST-64.
Regarding the relationship between **motor symptoms and age, age of onset and duration**, no statistically significant relationships were discovered.
Regarding the relationship between age, age on onset and illness duration, age of onset presented statistically significant relationships with non-perseverative errors (r=50, p<.05), unexpected errors (r=-.51, p<.01) and conceptual level responses (CLR, r=-.51, p<.05).

CONCLUSIONS: Motor symptoms remain an important clinical marker in schizophrenia, both in research and clinical settings. Their relationship to negative symptoms, and particularly the disorganization syndrome, marked by early onset, marked cognitive and negative symptoms, remains particularly important for future clinical research. Moreover, these symptoms apprear apparently independent of disease duration, onset or treatment.