

“The motor paradox”: Abnormal postural sway and gait disturbances in schizophrenia spectrum disorders

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Subtle motor abnormalities have been described in schizophrenic patients since the first descriptions of the disease [1,2] and are now properly conceptualized as early endo-phenotypes of schizophrenia. [3] Despite the role of psycho-motor disturbances as endo-phenotypic markers of schizophrenia spectrum disorders, very few studies have investigated the locomotor pattern of gait in schizophrenia. The present study aimed to detect the presence of gait disturbances and postural anomalies by means of “Gait Analysis System”, in order to identify specific underlying endophenotypic deficits in motor control. 21 patients and 14 healthy subjects have been analyzed in gait and postural sway by classic full Gait Analysis system. Schizophrenic patients showed a longer gait cycle compared to controls (cycle duration $sx=1,11\pm 0,09$ vs $1,04\pm 0,06$; cycle duration $dx=1,10\pm 0,09$ vs $1,04\pm 0,06$). This difference ($sx\ 0.065$, 95%CI [0.12-0.05]) ($dx\ 0.065$, 95%CI [0.12-0.003]) was significant ($sx\ t(35)2.2$, $p=0.03$) ($dx\ t(35)2.15$, $p=0.03$). Moreover, schizophrenic group had greater sway area with open eyes (sway area OE $107,5\pm 89.8$ vs $57,2\pm 31.8$). This differences (51.54 , 95%CI [97.28-5.20]) was significant ($t(35)=2.3$, $p=0.03$). Finally, patients had more postural stability following the removal of visual input, as demonstrated by more length of the curve (464.9 ± 180.68 vs 345.4 ± 54.17) (difference 119.43 , 95%CI [95.18+9.4]; $t(35)=2.7$, $p=0.01$) with no significative differences in the sway area, compared to controls.

According with current evidence, schizophrenic patients show a different locomotor pattern and specific postural sway abnormalities compared to controls. [4,5,6] Particularly, the present study found a “motor paradox” in the control of posture and balance in schizophrenia: notably, patients exhibit more postural instability with open eyes, as due to an interference of visual input; with postural stabilization following the removal of visual input.

The present findings would support the hypothesis of an information processing disorder, as a core feature of schizotypal vulnerability, associated to subtle deficits in basic motor control of postural stability. [4]

References

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Key words

Schizophrenia, posture, sway, gait analysis, information processing.