European Psychiatry 48 (2018) 49–50

Contents lists available at ScienceDirect

European Psychiatry

journal homepage: http://www.europsy-journal.com

Commentary

Commentary on "Motor system dysfunction in the schizophrenia diathesis: Neural systems to neurotransmitters"

ARTICLE INFO

Keywords:
Motor symptoms
Neuroimaging
MRI
Schizophrenia
Instrumental assessment

We were very pleased to read the excellent article by Abboud et al. [1], who provided a thorough synthesis of the bio-behavioral relevance of motor dysfunction in schizophrenia by presenting basic movement physiology, schizophrenia-related brain mechanisms, and putative molecular pathways, particularly in the context of dopamine hypothesis. We fully agree with the authors that multistage approach on this particular research topic is important and their work will supplement calls arguing for renewed interest in this rapidly developing research domain [1]. In this commentary we want to add some comments to the research framework outlined by Abboud et al., since there are a few key milestones that need to be reached in order to demonstrate the great value of the motor domain for both neuroscientific research and clinical practice [2]:

- in order to better capture dimensionality among genuine and medication-induced motor symptoms in schizophrenia and related spectrum disorders, we need to make use of both clinical motor rating scales as well as novel instrumental assessments [3]. Motor symptoms are very suitable for instrumental assessment (IA), which has several advantages. It needs less training compared to clinical rating scales because IA lacks an observer bias, has a high intra- and inter-reliability and high sensitivity to detect even subclinical motor symptoms. Also, IA generates a continuous, much more precise rating instead of the ordinal value in most rating scales. The use of IA might contribute to a better characterization of both transdiagnostically and dimensionally occurring motor symptoms and signs such as tremor, balance, gait, rigidity, flexibility, motor stereotypes, compulsive and ritualistic behaviors, or motor impulsivity, respectively. The instruments that are already available show that quantifying motor symptoms instrumentally is a valid alternative to clinical rating scales and the enormous progress in technological (mobile) devices that can measure movements, opens new possibilities in the research to motor symptoms in these patients groups;
- creating novel motor dimensions and categories based on objectively measurable parameters will open up new perspectives and targets for neuroscience research particularly in the context of early detection and intervention in psychosis and establishing neurobiologically reliable phenotypes;
- IA provides the opportunity for assessment in real-world environments for a longer period and hence, it offers the opportunity to identify sociodemographic and clinical circumstances under which these subtypes of motor signs and symptoms occur at the most and their relationship over time with other psychiatric and somatic symptoms. IA might also help to identify subtle motor and sensory deficits in the period preceding manifest psychosis not visible to the naked eye. Eventually, IA of motor symptoms might help to differentiate between genuine/primary motor symptoms and drug-induced movement disorders more precisely;
- from a practical perspective, downloadable applications or 'apps' for the smartphone could help patients to monitor their genuine motor symptoms and medication side-effects on a daily basis. IA might also help clinicians to objectively evaluate patient's complaints during daily rounds or after a particular period of time in the outpatient setting;
- Abboud et al. [1] referred to important regions within the motor system such as the primary motor cortex (M1), BA 6, comprised of the premotor cortex and Supplementary Motor Area (SMA), mid-cingulate cortex (dACC), the basal ganglia (e.g. globus pallidus, substantia nigra and sub-thalamic nuclei), and cerebellum, respectively. Abnormal morphology of these regions might contribute to neurological soft signs, abnormal involuntary movements, timing difficulties in movement execution, retarded finger tapping, reduced activation with wrist actigraphy, and reduced daily activity [4]. In particular, we believe that multiparametric mapping and connectivity measures of the above-mentioned regions might pave the way to thorough understanding of nigrostriatal and mesolimbic pathways. Beyond normal MRI, the combination of PET and MRI could visualize increased density of dopamine receptors in the striatum and fewer dopamine receptors in the dACC. This imaging technique will also work out the link between motor and cognitive symptoms (M1-SMA-Striatum-dACC) in psychiatric disorders;

https://doi.org/10.1016/j.eurpsy.2017.10.009

- future research needs to consider multimodality (both in terms of neuroimaging and behavior) and enrichment considering target populations who have been identified as exhibiting motor symptoms and signs;
- most importantly, to achieve the above-mentioned goals, future studies should be based on motor dimension as supported by the RDoC initiative rather than on categorical diagnoses. We very much appreciate previous and ongoing endeavor to include a motor dimension within the RdoC research framework [5]. Eventually, we're looking forward to the outcomes of such investigations and believe that all of these issues will have profound implications for clinicians and patients alike.

Disclosure of interest

The authors declare that they have no competing interest.

Acknowledgements

This commentary was supported by the German Research Foundation (DFG) (grant number DFG HI 1928/2-1 to D.H. and WO 1883/6-1 to R.C.W.).

References

[1] Abboud R, Noronha C, Diwadkar VA. Motor system dysfunction in the schizophrenia diathesis: neural systems to neurotransmitters. Eur Psychiatry 2017;44:125–33.
[2] Hirjak D, Thomann PA, Kubera KM, Wolf ND, Sambataro F, Wolf RC. Motor dysfunction within the schizophrenia-spectrum: a dimensional step towards an under-appreciated domain. Schizophr Res 2015;169:217–33.
[3] van Harten PN, Walther S, Kent JS, Sponheim SR, Mittal VA. The clinical and prognostic value of motor abnormalities in psychosis, and the importance of instrumental assessment. Neurosci Biobehav Rev 2017;80:476–87.
[4] Walther S, Strik W. Motor symptoms and schizophrenia. Neuropsychobiology 2012;66:77–92.
[5] Mittal VA, Bernard JA, Northoff G. What can different motor circuits tell us about psychosis? An RDoC Perspective. Schizophr Bull 2017;sbx087. http://dx.doi.org/10.1093/schbul/sbx087.

D. Hirjak[a,*], P.N. van Harten[b], R.C. Wolf[c]
[a]*Department of Psychiatry and Psychotherapy, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany*
[b]*School for Mental Health and Neuroscience, Maastricht University, Maastricht, The Netherlands*
[c]*Center for Psychosocial Medicine, Department of General Psychiatry, University of Heidelberg, Heidelberg, Germany*

[*]Corresponding author
E-mail address: dusan.hirjak@zi-mannheim.de (D. Hirjak).

Received 19 October 2017
Accepted 20 October 2017
Available online 10 January 2018