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Editorial

Lubrini et al.'s study, "The contribution of depressive symptoms to slowness of information processing in relapsing remitting multiple sclerosis"

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The relationship between depression and cognitive functioning in multiple sclerosis (MS) has been well studied, with an increasing number of recent investigations showing associations. However, there appears to be only one study that systematically manipulated cognitive task effort in relation to depression in MS. This study[1] showed that a depressed MS group performed worse compared with a nondepressed MS group on an effortful working memory task, but not on a less effortful simple span task. However, the approach was dichotomous, making it impossible to determine the point where cognitive demands exceed depressed patients' available resources. Examining cognitive functioning on a continuum makes this approach possible, with reaction time (RT) tasks providing an ideal method for doing this.

In Lubrini et al.'s[2] study, the authors aimed to manipulate cognitive effort using a range of simple and complex RT tasks. They predicted that depressed MS would perform worse than nondepressed MS on complex but not simple RT tasks. The authors' work is guided by the "cognitive effort hypothesis," which asserts that depression interferes only with highly effortful tasks requiring a great deal of attentional capacity.

An appealing feature of Lubrini et al.'s study is that the authors included a normal control depressed group for comparison with the depressed MS group. This allowed them to address the question in relation to cognitive functioning: Is having MS and depression worse than having depression alone? This is an important question and one, to my knowledge, that has not been addressed in prior work.

To examine these issues, the authors divided 68 MS patients into two groups according to the presence of depressive symptoms (DS) (defined by a cutoff score $\geqslant$13 on the Spanish version of the Beck Depression Inventory (BDI)). This method was then further verified by Strober and Arnett's[3] recently developed approach and resulted in 35 MS patients in the DS group and 33 in the group without DS. The authors also included 17 non-MS with DS and 27 healthy controls without DS.

All participants were administered four RT tasks ranging from basic reaction speed and simple perceptual-motor demands to more complex cognitive processes. They used two simple RT and two complex RT tasks; in each case, one task was slightly more cognitively demanding than the other. Thus, the authors had a dichotomous difference in terms of simple versus choice RT tasks, but also a continuum of effort required across the four tasks.

The authors' findings can be considered along the dimensions of RT and accuracy. Compared with the MS without DS group, the MS with DS group was significantly slower on the two complex RT tasks but not the simple RT tasks. The non-MS controls showed the more specific pattern that the authors had predicted from the cognitive effort hypothesis, with non-MS DS group being slower than the non-MS group without DS only on the most complex RT task. Additionally, compared with the non-MS group with DS, the MS group with DS was significantly slower on the two complex RT tasks but not the simple RT tasks. Regarding accuracy, the MS with DS group made significantly more errors on the tasks overall compared with the non-MS with DS group, but there was no group × task interaction. Of note, however, it is difficult to interpret these accuracy data because (as Table 2 shows) the group difference was clearly dictated by the MS with DS groups' poorer accuracy only on the second most effortful complex RT task; the groups were nearly the same on the most effortful task, the Choice Reaction Time (CRT) - Search.

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The authors' results showed that depression symptoms in MS differentially impacted effortful compared with less effortful cognitive tasks as reflected in slower RT only on the complex RT tasks. Additionally, the MS with DS group performed worse than the non-MS with DS group, showing slower RT on both complex but neither of the simple RT tasks and also being less accurate overall.

The authors' more pointed cognitive effort hypothesis was that, compared with individuals without DS, those with DS should only perform worse on the most cognitively effortful CRT—Search task used. This was not supported when the MS groups were compared but was supported in the non-MS control groups. Instead, the effect found in the MS groups was more generalized, with the MS with DS group performing more slowly than the MS without DS group on both complex RT tasks. Thus, depression in MS appears to differentially impact cognitively effortful tasks and having MS and depression is worse than depression without MS. In the final analysis, comorbidities matter.

This study has several strengths. First, the groups were generally well matched, with MS with DS comparable to MS without DS in terms of demographics and disease characteristics, and also non-MS with DS demographically. Additionally, as noted earlier, this appears to be the first study on depression and cognitive functioning in MS that included a non-MS depressed group. The value of including this group in understanding depression and cognitive functioning in MS was evident, in that the authors were able to demonstrate for the first time in this literature that having depression and MS is worse than having depression alone; having MS with DS results in deficits not only on the most effortful cognitive task but also on a task farther down on the continuum of cognitive effort. This was despite the fact that the non-MS with DS group had *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5) Major Depression diagnoses, whereas the MS with DS group was identified with a less rigorous method using a standard BDI cutoff. Although methodologically this is not ideal, the results ran counter to what one might expect if this proved to be problematic. If these different diagnostic methodologies introduced a true confound, then the non-MS with DS group should have been more impaired on the cognitive tasks than the MS with DS group; in fact, the opposite was found.

In summary, although it has a few limitations, Lubrini et al.'s study makes an important contribution to the MS literature. It shows for the first time that having depression in MS is worse than having depression alone in terms of the impact on cognitive functioning. The study also lays out a template in terms of both cognitive task selection and depression group allocation that will allow future work to expand upon our understanding of the interplay of depression and cognitive functioning in MS.

References

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