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The importance of cross-national and cross-cultural research in understanding the central nervous system complications of HIV disease

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Ninety percent of all HIV disease exists outside of the northern hemisphere, and in countries without the same public health and healthcare systems that we enjoy. We can forget that our citizens with access to medical care enjoy the potential for near normal life expectancy, whereas those in sub-Saharan Africa, for example, may consider themselves privileged to receive any ART.

Thus, we are faced with two epidemics. One of them is being aggressively controlled with medication, although prevention of the initial infection remains a major weakness. The second epidemic not only has rampant infection, but has limited resources for diagnosis and limited treatment options. Research tools, especially those that are useful for tracking the clinical manifestations of HIV must be able to be used in both of the epidemics. The problem is exacerbated by the fact that among the medically resource limited areas of the world, differences in language, culture and education relative to resource-rich areas could make comparisons difficult, if not impossible.

The most exciting aspect of the data reported by Cysique *et al.* (pp. 983–990) is that by using tests that were originally developed in the West, primarily in the context of localization of central nervous system (CNS) dysfunction following stroke, tumor, or similar conditions, the team from China and the University of California San Diego (UCSD) HIV Neurobehavioral Research Center were able to obtain valid and reliable data. With careful analysis and interpretation of the data, neuropsychological tests in the United States can be used to evaluate HIV-associated cognitive impairment in an international setting such as China. Unfortunately, the data revealed that HIV disease, as we knew it in the West 10 years ago, is still alive and well elsewhere. The good news is that once treatment is initiated, the signs/symptoms of CNS dysfunction are in many cases brought under control. The strength of the study is the use of longitudinal HIV-seronegative normative data collected locally in China as a comparison group.

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From a public health policy perspective, the data also demonstrate the critical importance of early and effective control of viral replication and reconstitution of the immune system. Decline in neuropsychological test performance was linked to lower nadir CD4⁺ cell counts, having AIDS at study entry, and having poorer treatment response (i.e., detectable HIV RNA while on HAART). If immune status did not improve during the observation period, this was also associated with declining test performance.

Confounding conditions associated with cognitive impairment also need to be considered when evaluating the data. In particular, a previous study by the same group found that hepatitis C coinfection was also associated with an increased risk of cognitive impairment among HIV-infected individuals in China. However, data from the current study suggest that hepatitis C coinfection was not related to subsequent cognitive decline.

In evaluating HIV-associated cognitive impairment in an international setting, one needs to consider the impact of HIV subtype. In the United States, HIV subtype B is predominant whereas in China, B, C, and B/C recombinants are the predominant subtypes. Other studies suggest that subtype C may be associated with less cognitive impairment due to a mutation in the HIV subtype C *tat* gene [1]. The impact of HIV subtype on both baseline cognitive performance and cognitive decline is an area that requires further study in China.

The change in cognitive test performance was also linked to other aspects of behavior. Those individuals whose performance declined were more likely to have a clinical depression at follow-up (21 versus 9%), and to have declining independence in activities of daily living. Whereas cognition, mood, and functional independence are tightly interrelated, these data demonstrate that the changes observed by the study team were not simply a statistical phenomenon, but had a clear impact on the ability of the patients to function effectively in their social and work environments. To the extent that the rural community in China is more intergenerational than other Western areas, the impact of such alterations could be felt across three or more generations, those of the patient, their children, and their parents (and perhaps, grandparents or grand-children). In cultures that rely on cross-generational support for the effective functioning of the community, loss (or decreased abilities) of one link in the chain can have widespread impact.

References

1. Li W, Huang Y, Reid R, et al. NMDA receptor activation by HIVTat protein is clade dependent. *J Neurosci*. 2008; 28:12190–12198. [PubMed: 19020013]