Virtual Reality in the Treatment of Psychiatric Disorders

By Barbara Olasov Rothbaum, PhD

Virtual reality's (VR) application in psychiatry has come a long way since the first controlled study from 1995.[1] That study was considered a "test balloon" by its authors to explore the use of VR in the treatment of psychiatric disorders, and it found that virtual reality exposure (VRE) therapy was more effective than the control for treatment of the fear of heights. Most importantly, the authors found that exposure to VR heights translated into modified behavior in the real world in that more patients treated with VRE reported exposing themselves to real life height situations following treatment. Since then, a solid body of literature has accumulated attesting to the effectiveness of VR for the treatment of anxiety disorders, usually using VR to present the stimuli used for exposure therapy and following general cognitive-behavioral therapy principles for the treatment of anxiety disorders.[2,3] More recently, VR has also been used for the treatment of substance use disorders[4] by presenting in VR the substance cues that induce craving.

An innovative use of VR in psychiatry combined the administration of a medication in combination with a precisely controlled VRE paradigm.[5] D-cycloserine, a partial agonist at the *N*-methyl-D-aspartate receptor, has previously been shown to improve extinction of fear in rodents. Single doses of placebo or D-cycloserine (50 mg and 500 mg, respectively) were taken prior to each of the two sessions of VRE. The group receiving D-cycloserine during VRE demonstrated significantly greater improvements on all measures immediately post-treatment that were maintained at 3-month follow-up. This has implications for using VR to exactly control the experimental stimuli and to ensure that each research participant receives exactly the same exposure. This has been very difficult to accomplish previously in psychological interventions research.

The articles in this *CNS Spectrums* extend the applications of VR even further into neuropsychiatric domains. Albert A. Rizzo, PhD, and colleagues discuss the use of a virtual classroom and demonstrate how one virtual environment can be used for multiple purposes, particularly around attention-deficit and hyperactivity. Hunter G. Hoffman, PhD, and colleagues discuss the use of a virtual Snow World to aid distraction in a successful attempt to reduce pain in burn patients, with an innovative design to use brain imaging with VR. Vince D. Calhoun, PhD, and colleagues present the multiple uses of a virtual driving simulator, especially useful at assessing impairment caused by driving under the influence, again using brain imaging techniques to inform the impact of VR.

Together, these innovative researchers will give you a glimpse of the future in the applications of VR. ***CNS***

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