Article: 1332
Topic: 61 - Posttraumatic Stress Disorder

RADIATION POST-TRAUMATIC STRESS DISORDER

K.N. Loganovsky*, N.A. Zdanevich*

Radiation Psychoneurology, State Institution 'National Research Centre for Radiation Medicine, National Academy of Medical Sciences of Ukraine', Kiev, Ukraine

Background: Whether PTSD following radiation emergency has psychopathological, neurocognitive and neurophysiological peculiarities is at issue.
Goal: To explore features and cerebral basis of “radiation” PTSD in the Chernobyl accident survivors.
Subjects and methods: The cross-sectional study included 241 people, 219 of whom have been diagnosed with PTSD according to the DSM-IV criteria, among them 115 clean-up workers [liquidators] of the Chernobyl accident (34 with acute radiation sickness), 76 evacuees from the Chernobyl exclusion zone, 28 veterans of the war in Afghanistan, and 22 healthy unexposed individuals. Psychometric examinations, neurocognitive assessments, computerized electroencephalography, and cerebral vascular Doppler were used.
Results: “Radiation” PTSD includes: “flashforward” phenomenon and anticipating stress (projection of fear and danger to the future); somatoform disorders, depression, trait and state anxiety; neurocognitive deficit (impaired memory and attention, auditory-verbal memory and learning, proactive and retroactive interference; cerebellar and stem symptoms, intellectual changes). The intima-media component thickness of common carotid arteries, and common and left internal carotid arteries stenosis rates are increased in the liquidators. Changes of bioelectrical brain activity as a decrease of beta- and theta-power together with an increase of alpha-power were found in the Chernobyl accident survivors with PTSD.
Conclusions: PTSD following radiation emergency is characterized by comorbidity of psychopathology, neurocognitive deficit, and cerebrovascular pathology with increased risk of cerebral atherosclerosis and stroke. Cerebral basis of this PTSD is proposed to be an abnormal communication between the pyramidal cells of neocortex and hippocampus, and deep brain structures.

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