

## VISUAL VERTEX POTENTIAL AND PSYCHOPATHOLOGY OF CHILDREN IRRADIATED IN UTERO

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One hundred children acutely exposed to prenatal irradiation born between 26 April 1986 and 26 February 1987 from pregnant women evacuated from the 30-km Chernobyl exclusion zone (main group) were examined. The controls were 20 non-exposed age-matched children. Clinical, psychological (adapted Wechsler intelligence scale for children (WISC), Ratter A(2) scale) and neurophysiological (computerised 19-channel EEG, visual checkerboard evoked potentials (VEP)) methods were used. Integral IQ < 70 was observed in 2% exposed children. There were an increase of borderline and low range IQ (IQ = 70–90) and a decrease of high range IQ (IQ > 110) in the main group. The verbal IQ was significantly lower than non-verbal IQ ( $93.5 \pm 1.7$  vs.  $99.7 \pm 1.4$ ;  $P < 0.05$ ) in the irradiated in utero children as compared to the control ( $101.6 \pm 2.1$  vs.  $99.1 \pm 1.9$ ;  $P > 0.05$ ). Emotional and behavioural disorders were noticed by 47% of the parents of the exposed children and 26% of the control. The exposed children had middle- and low-voltage disorganised EEG with slow and paroxysmal activity lateralised to the left fronto-temporal region. Spectral analysis showed an increase ( $P < 0.05$ ) of  $\delta$ - and  $\beta$ -power, especially in the frontal-temporal regions (mainly left-side) and a decrease of  $\theta$ - and  $\alpha$ -power. VEP  $P_{100}$  amplitude was increased and  $P_{100}$  and  $N_{145}$  latencies reduced. In 65% of exposed children the visual vertex potential at Pz was registered. It was a double-phase wave of a high amplitude ( $P_{100} = 15.7 \pm 2.4$   $\mu$ V;  $N_{145} = 21.8 \pm 3.1$   $\mu$ V). This potential was not found in the control. The visual vertex potential has been typically observed in children exposed at the 1st and 2nd trimester of pregnancy, and associated with attention disturbances, verbal intelligence deficits, disorders of psychological development, as well as paroxysmal states like psychosensoric seizures. We consider that the visual vertex potential and cognitive deficits may be an after-effect of developmental disorder of the brain due to a complex of radiation and non-radiation factors of the Chernobyl disaster.

## CHRONIC FATIGUE SYNDROME AS A CHARACTERISTIC AFTERMATH OF RADIOECOLOGICAL CATASTROPHE

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In our previous works we proposed Chronic Fatigue Syndrome (CFS) as a radioecological disaster aftermath triggered by low and very low doses of ionizing radiation together with stress. One hundred randomly selected Chernobyl accident survivors were examined clinically and psychophysiologicaly. Twenty-six survivors (18 women and eight men, all right-handed, aged 32–57 years) met the CFS diagnostic criteria. Their absorbed doses following the Chernobyl accident were less than 100 mGy, and had not produced any clear deterministic radiation effect. Clinical symptomatology included persistent fatigue, odd skin sensations, bizarre feelings in bones, muscles and joints, irritability, headache, vertigo, pain in the heart area, emotional liability, irritability, lack of concentration and memory, cognitive deterioration, depression signs and sleep disorders. Their hypochondria, psychasthenia, depression and schizophrenia scores on the MMPI profile were elevated. EEG spectral analysis showed an increase of  $\theta$ -power (> 4–7 Hz) lateralised to the left fronto-temporal region, together with  $\alpha$ -power (> 7–12 Hz) depression. The late components of somatosensory evoked potentials (SSEP) to right median nerve stimulation were retarded in the left central region (projection area  $C_3$ ) ( $268.3 \pm 3.7$  ms vs.  $235.1 \pm 3.7$  ms in healthy controls,  $P < 0.01$ ) and decreased in amplitude ( $10.6 \pm 1.6$   $\mu$ V vs.  $18.4 \pm 1.8$   $\mu$ V in healthy controls,  $P < 0.05$ ). Their scores on the hypochondria MMPI-scale increased in a linear proportion to a decrease of SSEP  $P_{268}$  amplitude ( $P < 0.01$ ) in the left central region  $C_3$ . These results testify to the cerebral basis of CFS, which is probably localised in the cortical–limbic structures of the left, dominant, hemisphere. CFS is a one of the most important consequences of radioecological disaster resulting in an interaction of different hazardous environmental factors, and should be included as a diagnostic category of the ICD-10.

## EYE MOVEMENT AND AUTONOMIC DYSFUNCTIONS IN ATTENTION-DEFICIT HYPERACTIVITY DISORDER AND PATIENTS WITH FIRST-EPISODE PSYCHOSIS

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Opposing processing strategies reflected in hemineglect and over and under arousal have been found in ADHD and schizophrenia. Evidence suggests an initial right spatial hemineglect in schizophrenia whereas a left visual hemineglect has been found in unmedicated children with ADHD. There is additional evidence that pupillary response to a stimulus is attenuated in schizophrenics compared with controls, suggesting reduced autonomic nervous system function. We hypothesised that, compared to controls, unmedicated