Background and Aims – Investigation of intellectual and psychosocial development of persons from Belarus exposed in utero to radiation following the Chernobyl accident in 1986. Antenatal exposure of the thyroid gland to radioiodine is one of the factors that might impact upon intellectual development.

Methods – Intellectual and psychosocial assessments were performed on 250 persons randomly selected from children exposed to Chernobyl fallout in utero recorded in the Belarusian Chernobyl State Registry and 250 controls similar in age drawn from settlements with $^{137}$Cs soil levels indicating little radioactive contamination. The mean fetal thyroid doses from $^{131}$I intakes by the mother were estimated to be ~ 400 mGy in the exposed group and 40 mGy among controls; mean fetal doses from external exposure were estimated at 10 mGy and 0.2 mGy respectively. Intellectual development was evaluated at ages 6–7, 10–12, and 15–16 years using the Wechsler Intelligence Scale for Children (WISC-III)UK validated for use in adolescents. Psychosocial assessments were based on interviews with subjects and their parents. We used t-tests to analyze continuous variables and $\chi^2$ tests for comparisons of proportions.

Results – At 6–7 years of age, the exposed group had a lower mean full-scale intelligent quotient (IQ) compared to controls (89.6±10.2 vs 92.1±10.5, $P=0.007$). Group differences at 10–12 years (94.3±10.4 vs 95.8±10.9) and 15–16 years (98.2±10.7 vs 99.5±10.5) were not significantly different. Inverse correlations were observed between prenatal exposure dose and IQ both for (i) $^{131}$I: at 6–7 years ($r=-0.11$), at 10–12 years ($r=-0.21$), at 15–16 years ($r=-0.29$); and (ii) external irradiation: at 6–7 years ($r=-0.14$), at 10–12 years ($r=-0.13$), at 15–16 years ($r=-0.19$) but were not statistically significant. The exposed group had a higher incidence of developmental disorders of speech, language and motor function, and childhood-onset emotional disorders and disorders of social functioning.

Conclusions – Unfavorable social-psychological and social-cultural factors (low parental education level, adaptation difficulties following relocation from contaminated areas) proved to play a significant role in the genesis of borderline intellectual functioning and emotional disorders in in utero exposed persons.