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Physiological role of urban pollutants at different stages of human development

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The modern biogeochemical situation of the environment, characterized by a progressive accumulation of toxic substances, has led to an imbalanced concentration of toxic and essential elements in the human organism. The present study looked at the functional state of the central and autonomic nervous system, and cardiovascular and immune systems of 195 children and teenagers, 110 adults, including 30 newborns and their mothers with regard to toxic (5), essential (3) metals, and DDT & HCH pesticides and their isomers (5 and 3 correspondently). Hair of all groups, blood of newborns and their mothers, and mother's milk at background exposure were examined for the presence of pollutants. The concentration of toxic metals mainly fluctuated within normal limits, a deficiency was prominent for essential elements, and pesticide content was very variable, with a difference up to 200 times in some individuals. A correlation between some of these pollutants, essential elements and physiological parameters was revealed with the accuracy significance varied from 0.3 to 0.8 and probability 91-99%. It is interesting that even when the concentration of pollutants did not exceed a normal range, it still played a definite role in the functioning of the systems. A comparison of the physiological importance of different pollutants was conducted. Sensitivity of organism systems to heavy metals was estimated and certain specific peculiarities of their action were revealed. For instance, while arsenic had almost no influence on the central nervous system, many correlations were revealed for the parameters of cardiovascular system, especially during physical load. According to the number of correlations and their density, the toxic metals in normal concentrations, even at background exposure in the urban environment, seem to be more physiologically active than essential ones.