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Blood tyrosine level as an index of tissue provision with glucocorticoids and as a promising laboratory test for monitoring glucocorticoid therapy

Irma T. Rass
Center of Theoretical Pharmacology, Russia

Glucocorticoid preparations for more than 60 years form one of corner-stones of clinical medicine. In rheumatology they are used as the most powerful anti-inflammatory, anti-allergic, and immunosuppressive drugs. But it is difficult to predict the efficiency of glucocorticoid treatment in individual cases and sometimes it is impossible to abolish these preparations. Serious adverse effects associated with glucocorticoid therapy are essentially caused by absence of a parameter characterizing the tissue provision with glucocorticoid hormones (or preparations) and a real need in them of a patient under various circumstances.

For glucocorticoids a parameter is required which would be similar to blood level of glucose on using insulin. This parameter must have rather narrow normal limits, clearly depend on glucocorticoids, and its determination in blood must be easy. And blood level of tyrosine can be used as such a parameter due to specific features of its catabolism.

The idea of using blood tyrosine as a parameter for monitoring glucocorticoid therapy was proposed based on observed correlations of glucocorticoid efficiency and blood tyrosine behavior in patients with systemic lupus erythematosus; then the proposal was confirmed by observations in bronchial asthma. But the most convincing arguments in favor of this idea were obtained at the substitutive glucocorticoid therapy in children with adrenogenital syndrome and also by experimental data on injection–withdrawal of glucocorticoids in adrenalectomized rats.

It should be noted that determination of blood tyrosine is rather easy and is routinely performed in Canada in newborns to reveal genetic disorders in the tyrosine catabolism.

Biography

Dr. Sc. (Biology) Irma T. Rass born in Moscow July 7, 1934.

Graduation - Moscow State University, Biological Department, Chair of Biophysics.

Postgraduation - Institute of Developmental Biology, the USSR Academy of Sciences. Candidate's Dissertation in cellular radiobiology. Research worker (Institute of General Genetics (the USSR Academy of Sciences); then Clinics of Occupational Diseases (I Moscow Medical Institute) where became interested in problems of clinical medicine, especially of using glucocorticoid preparations in various non-endocrine diseases.

Doctoral Dissertation (1984, Biology) concerns the physiological and biochemical basis of glucocorticoid therapy (experimental and clinical study).

Senior research worker – Institute of Biological Testing of Chemical Compounds, Moscow.

Leading research worker – Center of Theoretical Pharmacology, Russian Academy of Sciences, Moscow.

Professor emeritus. Collaborate in the monthly international journal Biochemistry (Moscow).

Dr. Irma T. Rass is interested in glucocorticoid hormones, their role under various conditions, and the problem of adequate assessment of adrenocortical function. In 2010, Dr. Irma T. Rass published in Biochemistry (Moscow) (75/3, pp. 353-366) a paper entitled "Blood Content of Tyrosine Is an Index of Glucocorticoid Action on Metabolism" in which a possibility of using blood tyrosine level for monitoring glucocorticoid therapy was also discussed.

irma2@kmail.ru