Usage of sodium succinate for treatment

of acute respiratory –viral infections for children

Shortage of effective etiotropic antiviral remedies causes necessity to search for preparations, stimulating protection of human body against infections and capable of facilitating course of acute respiratory viral infections for children in line with reducing risk of complications. Experimental researches have proved favourable impact of sodium succinate under different pathologic conditions, being realized probably due to energy processes within mitochondrion. Successful intake of sodium succinate for children of tender age with bronchial allergy and pneumonia provided basis for usage of the latter preparation under uncomplicated and complicated variations of acute respiratory – viral infections (ARVI) for children. Advantages of sodium succinate are as follows: harmlessness of the preparation, absence of cumulative features and good tolerance. The preparation is being administrated for children in compliance with licence of Pharmaceutical Committee (minute No 3 of 30 July of 1972 USSR).

141 children at the age from 2 to 5 years suffering from uncomplicated and complicated cases of SRVI have been passes under doctors' monitoring at the clinics of pediatric infections (Leningrad). Sodium succinate has been involved in usual pathogenic therapy for 108 children during the course of acute period of disease; 33 of patients have not been treated with sodium succinate and comprised the comparative group. Laboratory diagnostics of ARVI for children has been performed involving generally accepted serological and immunofluorescence methods with additional definition of classes of specific immunoglobulins M and G in a way of destruction of macroglobulins using preparation of mercamine group. Using the method of quantitative hemadsorption within original modification and heterospecific thermolabile beta – inhibitors in Merskey's reaction with virus of Newcastle disease, interferon has been determined of all the children. Determination of contents of secretory immunoglobulin has been carried out according to Manchini. Percentage and absolute number of T-lymphocytes within one millilitre of blood have been determined for 141 children during dynamics of ARVI according to the reaction of spontaneous rosetting with erythrocytes of sheep and B - cells using rosetting reactions with zymosan and complement. Percentage of T and B rosettes in the preparation has been counted under absolute quantity. Therapeutical effectiveness of sodium succinate has been estimated according to the following characteristics of ARVI: height and duration of temperature, duration of intoxication and catarrhal syndrome and frequency of development of bacterial complications. History of pediatric diseases with defined etiology of disease has been involved into analysis.

Maximal body temperature of patients treated with sodium succinate, duration of temperature reaction and intoxication was the same as indicators of comparative group. Substantial differences between the groups have been observed only at the extent of catarrhal syndrome. For the group of children suffering from uncomplicated influenzal infection being treated with sodium succinate rhinitis was likely to reduce on average by 2.8±0.6 days and for the group without intake of the preparation by 5.1±0.8 days. Under uncomplicated single agent infections of various genesis throat hyperemia involving treatment sodium succinate continued for 6,2±0,52 days in comparative group – for 8,5±0,4 ($p<0,05$) days. In the event of uncomplicated combined ARVI throat hyperemia accordingly continued for 5,3±1,67 days and for 10,2±0,86 days ($p<0,01$). Differences of frequency of delayed bacterial complications also have been observed: disease of patients treated with sodium succinate resulted in complication of pneumonia and bronchitis 3 times less as comparative group

(5,2% versus 16,6%). Substantial reduction of superinfection under conditions of in-patient hospital has also been observed. Reduction of continuation of catarrhal syndrome, reduction of frequency of bacterial complications can be explained as stimulation of local immune system mostly production of secretory immunoglobulin A (Ig A).

Results, achieved in defining IgA for children by using method of reliable intervals, have been subdivided into thee groups: low IgA concentration (5–30 mg/l) – 52 children, medium - (31–80 mg/l) – 10 children and high - (81 mg/l) 20 children. The group of children being treated with usual pathogenic therapy (24 children in the group) had 17 children with low IgA concentration, 3 with medium IgA concentration and 4 with high concentration. Low IgA concentration during the course of disease in the comparative group remained almost the same: 11,7±0,2 at the beginning and 10,9±0,4 mg/l during recovery. In the event of medium and high primary IgA concentration significant drop has been observed during the period of recovery, which 4-7 times gets ahead of results from comparative group. In the event of high IgA concentration children treated with sodium succinate were likely to have lower amount of IgA concentration in their nasal phlegm but nevertheless such reduction has been less expressed as for children of comparative group (64,4±6,0 mg/l and 45,5±6,1 mg/l, $p<0,05$).

Under impact of sodium succinate the amount of T – lymphocytes significantly increased not only in the group of uncomplicated ARVI, but also in development of complications (from 889±39 to 1217±57, $p<0,05$). Significant increase of the amount of B – cells has been observed only in the event of complicated ARVI for children treated with sodium succinate (from 285±11 to 337±19, $p<0,5$). Indicators of the state of non-specific resistance for majority of patients treated with sodium succinate have almost remained the same during the course of disease. The amount of thermolabile beta – inhibitors during the period of recovery has not increased their content during the period of acute respiratory viral infection.

Increase of the level of serumal interferon has been observed during dynamics of ARVI for children treated with sodium succinate from 5,2 to 10 units/ml ($p<0,05$).

But as it is known concentration of interferon less than 10 units/ml is not enough for relief of clinical evidence of ARVI. Thus the present researches have proved out advisability of intake of sodium succinate as the component of complex treatment for children, suffering from ARVI.

Authors: Ivanova V.V, Kurbatova G.P, Blagoslovenskij G.S, Aksenova O.A.