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Lymphocyte subpopulations in Venezuelan preschool children of high socio-economic status

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Nutrition is a critical determinant of the immune response, thus malnutrition is the most common cause of immunodeficiency in the world. Micronutrient deficiencies, especially Zn deficiency, have already been shown to be associated with modification of the immune response in undernourished children, mostly those living in poverty; however, data on children of high socio-economic classes is lacking. The aim of the present study was to establish lymphocyte population values and to investigate possible interactions with nutritional status, Zn deficiency and socio-economic conditions in a group of children from high socio-economic classes.

The subjects were 104 preschool children attending a private nursery. Their nutritional status was measured by the weight-for-height anthropometric indicator[1], lymphocyte subpopulations ($CD3^+$, $CD4^+$, $CD8^+$, CD20) by flow cytometry and serum Zn by atomic absorption spectrophotometry. Socio-economic data were collected using the Graffar-Méndez method[2]. Data are presented as means and standard deviations, frequency and percentile distribution. Statistical analysis was by Student's *t* test, ANOVA and Bonferroni test, with a significance level of $P<0.05$.

A normal nutritional status was found in 74.3% of the children, 9.5% were undernourished and 16.2% were overweight. Lymphocyte subpopulations ($CD3^+$ 65 (SD 6)%, $CD4^+$ 34 (SD 6)%, $CD8^+$ 28 (SD 6)%, CD20 18 (SD 5)%) and serum Zn (889 (SD 150) μg/l) were within normal values. There was no significant difference by gender, age or nutritional status. Low concentrations of serum Zn were present in 6.7% of the children. There was a tendency to lower (NS) values for the T lymphocyte population for those children with serum Zn < 730 μg/l (10th percentile for the population), as shown in the Table.

	Serum Zn ≤730 μg/l		Serum Zn >730 μg/l	
Lymphocytes	Mean	SD	Mean	SD
T CD3 (%)	62	5	65	6
T CD4 (%)	33	5	35	6
T CD8 (%)	25	6	28	6
T CD4:CD8	1.34	0.68	1.30	0.39
B CD20 (%)	19	7	18	6

Since there are no reference values for the lymphocyte subpopulation in Venezuelan children and these results are in agreement with previous reports relating to other population groups[3], the up-to-date data from the present study could be used as a reference for future studies.

These children from high socio-economic classes showed lymphocyte populations within the normal range and a low prevalence of Zn deficiency. Although a significant association between the lymphocyte population and serum Zn was not observed, the data provide information on the association between Zn concentrations and cell-mediated immunity expressed by T lymphocytes, as previously reported[4].

Poverty, infectious diseases and poor sanitation contribute to the development of undernutrition and specific micronutrient deficiencies, and to modifications of the cellular immune response. Maintenance of an adequate nutritional and immune status in the children evaluated could be associated with a protective environment related to their socio-economic status.

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