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**Abstract
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Investigating the variation of boron in scalp-hair from three different population groups in Alcalá de Henares (Spain)

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BACKGROUND AND AIM:To study the content of boron (B) in scalp hair from school children born/living in Alcalá de Henares (Madrid Region), as B-hair analysis has been suggested as a useful exposure tool.

METHOD:Samples were collected from 120 children (70 girls, 6-9 years-old) and 97 adolescents (68 girls, 13-16 years-old) which met strict inclusion criteria to minimise factors that may affect elemental content in hair. B was monitored by ICP-MS after appropriate removal of exogenous contamination. Data was processed with the NADA package available in R due to high levels of censored data (89.2%, LoD=2.679; 94.8%, LoD=3.341 in $\mu\text{g/g}$, respectively).

RESULTS:Although not significant, levels of B were higher in children and female participants; data provided as ranges and 95-percentiles in $\mu\text{g/g}$, for children [overall 4.859 (2.732-7.415), males 4.061 (2.732-7.373), females 4.734 (3.348-7.415)] and adolescents [overall 3.362 (3.447-4.505), males 3.469 (P97.5 value) (<3.341-3.766), females 3.410 (3.447-4.505)]. Our results are in agreement with a previous study carried out in young adults living in the Madrid Region (20-24 years-old; range=1.33-4.86 $\mu\text{g/g}$), in which higher levels of B found in females was attributed to differences in the intake of vegetables, pulses and fruit. However, other authors have described that men would be more tolerable to the levels of B. Moreover, it has been reported that B is ten times higher in infants than in their mothers, which might explain the slightly higher levels of this element in children.

CONCLUSIONS:Despite the ranges of B in both Alcalá's schoolchildren groups being within the adequate reference ranges reported in Croatian (0.771-6.510 men, 0.472-3.89 women) and Polish (<LoD-14.37) adults (all in $\mu\text{g/g}$), the high levels of censored data might highlight an inadequate intake of B in the diet that should be investigated, as B may play an important role in obesity and bone metabolism.

Keywords: human hair, boron, exposure, schoolchildren