ABSTRACT

Urinary δ-ALA (ALA-U) is one of effective diagnostic index for early lead poisoning. It has been determined usually by the Marzerall-Granick's method using column of Dowex 2 resin in the acetate form or the Tomokuni's method using the extration with the organic solvent. Recently, a highly sensitive and simple method for determining ALA-U using reversed-phase high performance liquid chromatography (HPLC) is described. A fluorescent derivative with a specific character was derived from ALA-U by reaction with acetylacetone and formaldehyde in boiling water bath. It can be well separated through a ODS column (YMC-PACK) by HPLC.

Quantative results were obtained when (0.5-30.0 mg/L) δ-ALA standard solutions were tested (r=0.999). Sample recovery for 10 urine samples was about 96.7%. The concentration of δ-ALA in urine for 110 lead workers were 3.63±8.05mg/L and corrected by creatinine to 3.65±6.25mg/g creatinine while blood content were 50.8±21.6μg/dl. The concentration of urinary δ-ALA for 55 controls were 0.91±0.37mg/L and corrected by creatinine to 0.43±0.24 mg/g creatinine while blood content were 9.9±4.2μg/dl.

The advantages of simple procedure, high sensitivity and rapidity make this method useful for screening lead workers.

Key words:Blood Lead, Urine, δ-ALA, Acetylacetone, Formaldehyde, Fluorescent derivative, HPLC