OP – 09

Effectiveness and side effects of D-penicillamine in the treatment of lead poisoning in children exposed to lead poisoning from orange traditional medicine

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Objective: To describe the effectiveness and side effects of D-penicillamine at a dose of 15 mg/kg/day for 30 days for the treatment of lead poisoning in children.

Methods: A cohort study was conducted from January 2012 to October 2013. *Subjects:* children under 16 years of age who had been exposed to lead from using "Cam drug" (a traditional medicine), had a blood lead level (BLL) above 45 µg/dL or BLL from 20 to 44 µg/dL, with clinical signs of lead poisoning or a BLL that did not decrease after stopping the exposure for 2 months or longer, were selected for the study. Patients were treated with D-penicillamine chelation therapy at a dose of 15 mg/kg/day for 30 days and supplemented with iron, zinc, and vitamins according to age requirements.

Results: 52 children with lead poisoning (28 males and 24 females) were selected. 50 children (96.2%) were under 6 years. With D-penicillamine treatment, urine lead concentration (ULC) increased 5.6 times from 0.08±0.049 mg/L (at T_0–on admission) to 0.31±0.274 mg/L after 2 days (T_2) and increased 7.2 times to 0.48±0.297 mg/L after 30 days (T_{30}) ($p<0.001$). At the same time, BLL decreased 13.4% from 56.9±22.72 µg/dL (T_0) to 47.6±17.03 at T_2 and were 23% lower at 42.7±16.32 µg/dL at T_7; and decreased 27.2% down to 39.7 ± 14.21 µg/dL at T_{30} ($p <0.005$). The rate of decreasing of BLL in severely lead poisoned children was higher than in moderate or mild cases (37.7% vs 23.8% and 24.1%, $p<0.05$). Clinical symptoms improved markedly: nausea, vomiting and constipation stopped after 3 days while diarrhea resolved in 4 days. Anorexia decreased from 69% (36 children) at T_0 to 23% (12 children) at T_{30}. Hemoglobin increased rapidly: from 108.8±13.49 g/L (at T_0) to 120.7±6.55 g/L after 30 days of treatment. The incidence of anemia was reduced from 55.8% (29/52) to 5.6% (1/18) after 30 days of treatment. BLL at T_{30} was higher than BLL on admission in 2 patients (3,8%). Serum iron concentrations decreased from 11.1±4.23 to 10.8±5.01 µmol/L ($p=0.756$) after 7 days of treatment the rate of patients. The rate of patients with a serum iron <9 µmol / L increased from 9/28 (32%) to 15/39 (38%). Serum calcium was unchanged during the treatment (2.39±0.337 on admission vs 2.38 ± 0.179 mmol/L after treatment ($p=0.434$).

Conclusion: D-penicillamine at a dose of 15mg/kg/day for 30 days is effective and safe for the treatment of lead poisoning in children.