OP – 07

Effects of health education with milk and iron supplements on blood lead levels in young children

Satariya Trakulsrichai [1,2], Ratchaneewan Sinitkul [3], Charuwan Sriapha [2], Winai Wananukul [2,4]

[1] Department of Emergency Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, 10400. [2] Ramathibodi Poison Center, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand 10400. [3] Department of Pediatrics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, 10400. [4] Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand 10400.

Objective: Childhood lead exposure has received a lot of public attention as a health problem. Besides exposure abatement, health education and nutrition supplementation might be considered to be adjuncts to reduction of lead exposure. A prototype project of blood lead level (BLL) screening and management in young children was carried out in one industrial province in Thailand. One of the purposes of this project was to screen the BLL in young children (6 month-old to 6 year-old) in industrial areas. This study aimed to describe and analyze effects of health education combined with milk and iron supplementation on the BLL in young children in this project.

Methods: We performed a retrospective study of the data on BLLs in children recorded in this project.

Results: A total of 385 children were included in this project. Most were male (55.1%) and the median BLL was 3.47 μg/dL (0.48-28.23). Most (73.5%) had a BLL < 5 μg/dL. One hundred and two children had a BLL ≥ 5 μg/dL and about one-fourth of them were less than 3 years old. In this project, the interventions including health education about lead and lead measurement in the environment randomly by DELTA Lead Based Paint Handheld XRF Analyzers were done. We found that paints, appliances and toys in children's houses contained high lead levels and may have been the sources of lead exposure. All children with a BLL ≥ 5 μg/dL received milk (540 mL/day) and iron (1-2 mg/kg/day) supplements for 3 months. The BLLs of eighty eight children were rechecked after 3-months of milk and iron supplementation and 84% of them had a lower 2nd BLL. Amongst retested children, the median 1st and 2nd BLLs were 6.42 (5-28.2) and 4.65 (<3-51.6) μg/dL, respectively. The 2nd BLL of children was lower than the 1st BLL by 1.7 μg/dL or approximately 31.5%, which was statistically significant ($p < 0.001$). When we analyzed only children who had a lower 2nd BLL, the 2nd BLL was 35.3% lower (0.88%-74.77%). The 1st BLL was measured by both the point of care instrument (LeadCare® II) and standard atomic absorption spectrophotometry (AAS), however the 2nd BLL was only measured by AAS. In children with BLL ≥ 5 μg/dL, the Pearson correlation coefficient of the point of care instrument was 0.865.

Conclusion: Health education, environmental management combined with milk and iron supplementation might help to reduce the BLL in children. Nutrition supplementation should be evaluated and supported in lead exposed children.