Toxicity of lead at low dose

Sir,—A recent editorial (1989;46:593–6) reviewed the "low dose" toxicity of lead including any "...neurological damage to the fetus at blood lead concentrations as low as 15–20 μg/dl...."; reference was made to two American and to one Australian prospective studies.1,3

Children aged 4 who lived in a South Australian lead smelting city (population 15 000) and whose average postnatal lead blood concentration was 31±5 μg/dl "...had a general cognitive score 7.2 points lower... than those with an average concentration of 10:35 μg/dl....." Nevertheless, McMichael et al referred to the need to be "circum-spect in making causal influences from studies of this relation...".3

Parallel findings were not obtained in a study of similar aged children who lived in Sydney, Australia, which has a population of 2.5m. From an initial cohort of 218 children, 207 remained in the study at the end of the fourth year; their average blood lead concentration at that time was 10.1 μg/dl with only a few observations exceeding 15 μg/dl. The regression analyses showed that concentrations in the range of 10 to 10.7 μg/dl were not associated with mental or motor deficits4 as assessed by the McCarthy scales.5

Similarly, neither of the regressions using a weighted combination of previous and current blood lead concentrations as the independent variable (which represents the total exposure to lead over the four years) yielded a significant relation.4

Statistical analyses have also been carried out on children aged 3rd at 5 (GH Cooney, A Bell. Environmental toxicology group of the Victorian branch of the Royal Australian Chemical Institute and the Australian and New Zealand Environmental Mutagens Society, Ballarat, Victoria, 1988): the former did not support the hypothesis of a relation between Sydney maternal and cord blood lead concentrations up to 29 μg/dl and developmental deficits.6 At age 5, there were no significant mental deficits associated with cord blood lead concentrations about 10 μg/dl (Cooney and Bell), as have been reported in America.7 Both Australian studies are proceeding and the children, now aged 7, are being assessed.

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