

ENVIRONMENTAL
HEALTH
ABSTRACTS &
BIBLIOGRAPHY

April
1982

focus:
LEAD
POISONING

DEPARTMENT OF HEALTH AND HUMAN SERVICES - PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL, ATLANTA, GEORGIA 30333

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Foreword

Environmental Health Abstracts and Bibliography presents a survey of recently published literature in the field. Effort is made to keep the abstracts as current as possible and sufficiently informative to enable the reader to decide whether the original article would be of interest to him or her. The journals in which articles originally appeared should be checked for reprint addresses. The Centers for Disease Control (CDC) is unable to supply reprints of articles cited in this publication.

In compiling these abstracts we use the National Library of Medicine's (NLM's) interactive retrieval service, MEDLARS II. Under this system, both foreign and domestic biomedical periodicals are searched for material dealing with or related to environmental health. We also use the libraries of Emory University, CDC, and other federal agencies. Abbreviations of periodical titles are those used by MEDLARS and listed in NLM's *List of Journals Indexed in Index Medicus*.

Future issues of *Environmental Health Abstracts and Bibliography* will be devoted to various environmental health topics. Individuals wanting to be placed on the mailing key to receive future issues as published should write to the Environmental Health Services Division, Center for Environmental Health, Centers for Disease Control, Atlanta, Georgia 30333.

Vernon N. Houk, M.D.
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GENERAL

Is Low-Level Lead Pollution Dangerous?

D. Gloag. BR MED J 1980 Dec 13;281 (6255):1622-5.

From author's conclusions: The inferences drawn from the published work about children's susceptibility to the effects of modest concentrations of lead differ widely. One report concludes that there is probably no threshold for toxicity and that neurotoxic effects are liable to occur above a lead concentration of 5 ppm in dentine and 0.24 $\mu\text{mol/l}$ (5 $\mu\text{g}/100\text{ ml}$) in blood. Another report concludes that there were toxic effects above 3.9 $\mu\text{mol/l}$ (80 $\mu\text{g}/100\text{ ml}$) and that there was no convincing evidence of effects below about 1.7 $\mu\text{mol/l}$ (35 $\mu\text{g}/100\text{ ml}$). Although the research findings are "somewhat contradictory," the evidence suggests slight cognitive impairment (an average of one to five points' reduction) and, possibly, behavioral difficulties as a result of persistently raised blood lead concentrations over 1.9 $\mu\text{mol/l}$ (40 $\mu\text{g}/100\text{ ml}$); with concentrations below this, there are pointers to psychological risks, but the evidence is inconclusive.

Children and Lead: Some Remaining Doubts (Editorial)

Anonymous. ARCH DIS CHILD 1980 Jul; 55(7):497-9.

This editorial summarizes the conclusions of two comprehensive and authoritative reports on the effects of lead on the health and development of children. Although neither report conclusively confirmed a link between moderate body lead burdens (insufficient to cause obvious poisoning) and neuropsychological impairment, the majority of studies suggest such an adverse effect. Calculations suggest that the average city child derives 55%-95% of his blood lead from food, 0%-40% from water, and 3%-10% from air. Inhaled lead thus appears relatively unimportant. Priority should be given to removing lead-based paint from old houses, reducing lead in tap water in those areas where plumbosolvent water is drawn through lead pipes, and reducing emissions of lead into the air from gasoline.

Residual Effects of Lead Poisoning on Denver Developmental Screening Test Scores

S.C. Kirkconnell and L.E. Hicks. J ABNORM CHILD PSYCHOL 1980 Jun;8(2):257-67.

Authors' abstract: Subtest and total scores on the Denver Developmental Screening Test were examined for a group of 22 preschool-aged low-income children who had been lead poisoned, then medically delead. Pretest scores were obtained before blood lead elevations occurred; posttest scores were obtained an average of 4.5 months after deleading. Pretest scores were comparable with those of a matched control group, but posttest scores on the Fine Motor-Adaptive subtest declined, indicating significant residual effects of lead poisoning.

Some Comments on the 1980 Report of the United Kingdom DHSS Working Party on Lead in the Environment

M.J. Duggan. SCI TOTAL ENVIRON 1980 Dec;16(3):285-91.

A Department of Health and Social Security (DHSS) Working Party was appointed in 1978 to review the overall effects on health of environmental lead from all sources, particularly its effects on children's health and development, and to assess the contribution lead in gasoline makes to the body burden. Present author criticizes the Working Party's Report, which was published in March 1980, for a lack of emphasis on the exposure of children. The author is also critical of other aspects of the Report: "The Report does not deal with lead in dust and soil in a very unified way and plays down the importance of the contribution from petrol-derived lead by its emphasis on other sources—for example, paint, emissions from lead works, and such miscellaneous sources as the lead-based cosmetics used by the Indian community." The Report concludes that lead in gasoline is not an important contributor to the lead body burden in children and that the blood-lead level of this population is not high enough to give cause for concern. Author maintains that the Working Party, in reaching its conclusions, concentrated on adult rather than child exposure, and did not con-

sider data (from other countries) which suggest marked urban/suburban or urban/rural ratios for children's blood-lead levels.

Lead Poisoning: A Historic View

E. Morris. OCCUP HEALTH (LOND) 1980 Sep; 32(9):449-59.

From author's discussion: Of all the diseases known to medicine, few have been so widely studied and described as lead poisoning. Between the years 1500 and 1900 it reached almost epidemic proportions in many countries. The main symptom was severe, persistent abdominal pain, leading in many cases to eventual death.

A milestone in the gradual awareness of the harmful effects of lead was the investigation in 1767 by Sir George Baker of an ailment known as Devonshire Colic. Baker noticed an analogy between lead colic and Devonshire Colic, an ailment which frequently befell people who drank cider made in Devonshire, where it was common practice to line cider presses with lead. His findings were reported to the Royal College of Physicians, and, as a result, the practice of putting lead linings in cider presses was discontinued.

In 1839, a Frenchman, Tanquerel des Planches, conducted a very thorough study of lead poisoning. He showed clearly the causes and symptoms of such ailments, and later studies added little to his findings. The problem, however, lay not so much in the identification, but rather with the remedies. In the latter half of the 19th century, legislative attempts were made to overcome the problem of lead poisoning in industry.

Lead is a normal constituent of human tissue and regular absorption is a universal human experience. Only a small proportion of normally ingested lead is actually absorbed into the body. When an individual is exposed to more than the usual quantities of lead in the normal environment, evidence can be found in the body. Because specific clinical signs and symptoms do not usually present themselves until the stage of poisoning is reached, effective monitoring can only be done by using biochemical and hematological methods to determine changes before the onset of symptoms.

Absorption of Lead in Ancient Mesopotamia

P.B. Adamson. MED SECOLI 1979 Sep-Dec; 16(3):333-7.

Evidence has been presented that lead poisoning did occur in ancient Greece as early as the beginning of the fourth century B.C. Lead and silver ores were extensively mined in Anatolia and

Armenia in antiquity. The most commonly mined lead ore in Asia Minor in antiquity was galena, an easily mined yet relatively nontoxic substance. Lead products were used in cosmetics in ancient Mesopotamia by both sexes. In view of the widespread use of lead in trade and industry and of colored lead salts for cosmetic purposes, it is surprising that cases of overt plumbism are not frequently mentioned in Akkadian literature, but this is not the case. Although inhabitants of Mesopotamia, Greece, and Rome were all exposed to toxic lead salts, the degree of plumbism must have varied markedly between these different societies. Mesopotamian burial practices, however, left skeletal material exposed to acid soils and subsurface water, so it is hardly surprising that the archaeologists concerned took neither skeletal long bones nor samples of the surrounding soil to be chemically analyzed for lead content. This situation may, however, be remedied in future archaeological explorations.

Psychometric Techniques in Environmental Research

J.A. Valciukas and R. Lillis. ENVIRON RES 1980 Apr; 21(2):275-97.

Authors' abstract: Behavioral changes may be the earliest and only manifestation of neurotoxicity. Moreover, it is well known that extensive brain damage can occur with little or nondetectable clinical neurological deficit. Psychometric techniques now in use in toxicological and epidemiological research have been proposed to assess in an objective manner early manifestations of functional neurological changes that may be due to environmental neurotoxic agents. Methodological issues are reviewed and the following topics are addressed: (1) the description of representative examples of performance tests; (2) the validity and reliability of psychometric techniques; (3) the analysis of individual and composite test scores; (4) the nature of these variables; (5) the assessment of individuals and groups; (6) the use of multivariate statistical techniques; (7) the assessment of dose-response relationships; and (8) some methodological problems in the evaluation of neurotoxic effects when confounding variables are present. Psychometric techniques can be easily included in the protocol of cross-sectional health evaluation studies (morbidity studies); the sensitivity of psychometric techniques is partly a function of the discriminative selection of the appropriate tests, but it may be enhanced through the use of adequate mathematical-statistical techniques.

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*Abstracted