AMBULATORY TREATMENT OF LEAD POISONING

Henrietta K. Sachs, M.D.

Director, City of Chicago Lead Poisoning Clinic, Chicago, Illinois

During the first seven years of the 1960 decade, 1,200 cases of lead poisoning were reported in Chicago with 117 deaths. Community dismay over the high incidence of morbidity and fatalities, concentrated in only certain geographic areas of the city, prompted the Board of Health to initiate a broad lead screening program beginning in late 1966. In correlation with the case detection program, a specialized Lead Poisoning Clinic was established for evaluation and treatment of children found to have an elevated blood lead.

The screening program operates through eleven OEO-supported Urban Progress Centers from which a neighborhood canvass is conducted weekly. A Board of Health physician is in attendance at each Center once a week for 3 to 4 hours to draw venous blood specimens. These are analyzed for lead content in the Board of Health Clinical Chemistry Laboratory. Blood lead is measured by atomic absorption spectroscopy. Hematocrit and hemoglobin electrophoresis are determined on each specimen submitted. Forty ug lead/100 ml whole blood was selected as the upper limit of normal.

The chief source of patients who attend the Lead Clinic is the screening program. About 10% are satellite cases or referrals from physicians, infant welfare stations or community clinics. About 1,800 new patients are examined in the Clinic yearly. Appointments are made by telephone or letter. If the appointment is not kept, a home visit is made by the UPC representatives or the district public health nurse.

Approximately 95% of children with lead values of 60 ug.% report to the Clinic. Those with higher lead values are seen within 24 hours or as soon as they can be located following completion of the laboratory tests.

In the Lead Clinic, history, physical examination and laboratory analyses of blood and urine are completed at the first visit whenever possible. A second venous sample is drawn, and x-rays are taken of the abdomen, wrist and knee.

If the initial lead value was 50 ug.%, the child is given a therapeutic dose of EDTA as a provocative test, and an aliquot of all urine collected in the succeeding 8 hours is analyzed for lead content. If the repeat blood lead value is 60 ug.%, injections are continued; if 40-59 ug.%, the patient may be started on oral penicillamine or we may choose to wait until the urine lead is reported. Treatment is usually withheld if blood lead is under 50 ug.% and the child is followed at 3-month intervals until the environmental hazard has been eliminated.

The patient is treated on an outpatient basis unless history or physical examination suggest impending severe encephalopathy. We routinely give a 5-day course of EDTA, 50 mgm/kg with the addition of 15 drops of 1% procaine, as an intramuscular injection once daily. The site of injection is the anterolateral thigh. If much material is noted on KUB, fleet enema is administered when the patient reaches home. Blood lead is repeated 4 to 7 days after the first course, and a second course given if blood lead was 80 ug initially. Urine is collected daily for 8 hours after each injection of EDTA to check the lead output.

Penicillamine is used if initial values were under 60 ug or after blood lead falls below 70 ug following one or more courses of EDTA. It is given orally, 125 mgm two or three times daily, averaging 20 to 25 mgm/kg. Medication is continued until lead falls below 50 ug.% for 2 consecutive months.

To date, the Clinic has seen 10,000 children, of whom 2,214 or 23% were treated, and the remainder observed until the lead hazard no longer existed in the home and blood level remained below 50 ug.% on two successive tests. A history of paint ingestion is next in importance to elevation of blood lead in making a diagnosis of lead poisoning. Eighty-one per cent of our patients were observed to eat peeling paint from walls and woodwork, or broken plaster from the walls. Metaphyseal lines wider than 1 mm were also noted in 80%. Although credence is fairly definite at 2 mm. the 1 mm line was regarded as a worthwhile cue. Opaque material in the gut was present in 40%, screws, staples, coins, beads and open safety pins were unusual despite frequent assertions that the child puts everything in his mouth.

Symptoms were present in 8%, from loss of appetite to vomiting and drowsiness. A few children with convulsions were picked up in the initial telephone contact and promptly hospitalized at Cook County Children's Hospital.

About 10% continued to eat lead-containing material for varying periods, as demonstrated by x-ray of the abdomen, by a rise in blood lead or by a failure to drop as anticipated. This recurrence rate is about half that recorded by other observers.

Most of the subjects who presented with values of 60 ug.% or more were treated; however, there was a great deal of selection

of those in the 40 and 50 ug range. There were 465 children over 80 ug.% and close to 400 in the 70's. This is a terrifying potential for lead deaths, and one that makes us question the validity of only 117 reported deaths in the period from 1960 through 1966.

Conclusion. During 1967 and '68, there were 25 deaths attributed to lead poisoning, but in the three years following, there were only 8. The ambulatory Clinic has made a significant contribution to lowering the death rate and preventing hundred of cases of encephalopathy, with its almost inevitable sequelae of brain damage and neuromuscular defects. This has been accomplished by bringing a sense of urgency to the early recognition and prompt detoxification of children with this insidious, catastrophic disease.