

July 8, 1971

Richard W. Vilter, M.D., Director
Department of Medicine
Cincinnati General Hospital
Cincinnati, Ohio

Dear Doctor Vilter:

I enclose herewith the results of various analyses made in the Kettering Laboratory, at my request, on the urine and blood of Andrew Latchison, in order to determine his status with reference to the relative quantities of lead which remain now in his body, presumably in consequence of his years of work and exposure to lead, as an employee of National Lead Company, at this Company's plant at Granite City, Missouri.

This man's last day of work was August 17, 1969, so that there had been an interval of about 2 years, prior to his admission to the Cincinnati General Hospital, since he had incurred any occupational exposure to lead. He had been treated at the Veterans Hospital in St. Louis with 4 courses of penicillamin, which succeeded in reducing the concentration of lead in his blood from almost 0.08 mg. Pb. per 100 ml. on July 28, 1969, to 0.04 mg. per 100 ml. on November 26, 1969. It is not known how much lead was eliminated by him during this therapy, but the reduction in the blood level was very considerable, while the urinary response was that of a considerably increased output, and it may be presumed that the lead in the soft tissues of the body had been eliminated, largely, by the end of November 1969.

The response to the therapy which was administered in the General Hospital at this time (June 1971) is shown in the attached report. I have commented in a separate memo on the significance of the findings, so as to provide a record, which you may wish to attach to the hospital record. The information speaks largely for itself - in revealing that this patient still had a significant increase in the lead content of his body, at the time of his admission here.

I think it would be useful to me, if we could meet with Dr. Aring and discuss our joint findings at our mutual convenience.

Sincerely yours,

Robert A. Kehoe, M.D.
Professor Emeritus of
Occupational Medicine

RAK:wb

KE 0005367

N 7444



History

42 years age

Worked for National Lead in battery plate reconstitution

Was transferred to janitorial work but could not continue due to vision blackouts.

Lead tests have been done in the past on the blood and urine at the local level.

Has not worked in lead for two years

Has general weakness especially of feet and gait

Other disease processes are suspected at General Hospital, Multiple sclerosis and demylenation have been mentioned.

Neurological tests are being done at General and a laboratory in the east.

He will receive treatment for lead complexing for two days yet.

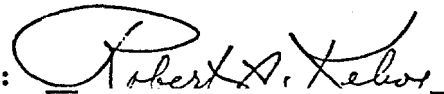
Attitude - Cantankerous but cooperative, it is believed the latter is influenced by the statement from his wife that unless he regains his potency that he need not return home.

KE 0005068

INTERPRETATION

The significance of the initially high value of lead in the blood lies in the fact that this elevation of the lead concentration (above normal limits) has occurred without any additional exposure on the part of this patient to lead - that is, without a return to work. This lead, therefore, has come out of the skeleton (presumably its trabecular portion) by way of restoring the equilibrium of this bony tissue with the soft tissues and blood, with respect to lead. /The skeleton retains a relatively high content of lead after chelation (as it did following the former treatment with penicillamine), but it reacts again and again to give up its lead, slowly, to the soft tissues, after the latter have been lowered greatly by chelation therapy. / The response in this instance, in greatly increasing the excretion of lead, thereby greatly reducing the lead content of the blood, is the appropriate response of the individual whose body burden of lead remains high long after the termination of his excessive exposure to lead. This fits in satisfactorily with the behavior of the precursors of hemoglobin.

Signed:


Robert A. Kehoe, M.D.

KE 0005369

KETTERING LABORATORY
COLLEGE OF MEDICINE, UNIVERSITY OF CINCINNATI
EDEN AVENUE, CINCINNATI, OHIO 45219

Name:



Material: Urine and Blood specimens

Submitted: 6-17 thru 6-24-71 by Dr. R.A. Kehoe, Kettering Laboratory
Cincinnati General Hospital, Cincinnati, Ohio 45229

Required: Lead Analyses

Results

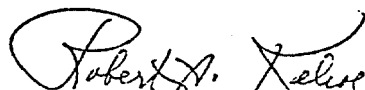
Date of Collection	URINE				Analysis Number
	Analysis Number	Volume Ml.	Specific Gravity	Mg. Pb/Liter	
6-17-71	71A-4559	130	1.020	0.10	71A-4560
6-19-71	71A-4577	550	1.020	0.12	
6-20-71	71A-4578	1620	1.020	2.60	
6-21-71	71A-4579	1430	1.020	2.20	
6-22-71	71A-4587	1580	1.015	1.50	
6-23-71	71A-4593	1780	1.020	1.20	71A-4616
6-24-71	71A-4614	1470	1.020	1.60	

INTERPRETATION

The significance of the relatively high initial values of δ -aminolevulinic acid and porphyrins in the urine of this patient - [REDACTED] - lies in the fact that they give a clear indication of the activity of lead in his body, in inhibiting the action of enzymes concerned with the production of hemoglobin.

The diminution of the concentration of these hemoglobin precursors, during the therapy (administration of $\text{Na}_2\text{Ca EDTA}$), is the regular return of these substances to normal levels, with the increased elimination of lead (presumably from the soft tissues of the body, including the bone marrow) induced by this chelating agent. It is the expected result, if and when the output of lead in the urine is greatly increased by chelation. The results demonstrate the presence of abnormal quantities of lead in chelatable form in the body of this man, and establish the fact that the lead was present in sufficient quantity to induce this effect. This does not, of necessity, prove that the lead in the body of this man is exerting a toxic effect, at this time, inasmuch as the action of lead is not known to be more than an indication of the presence of unusual quantities of lead.

Signed:


Robert A. Kehoe, M.D.

KE 0005071

Amino Levulinic acid and Porphyrins in spot and 24
hour specimens of urine.

Name: [REDACTED]

Pretreatment: 6/19/71

*Treatment started: 9:00 AM 6/20/71

Attended by: Dr Foss and Andrew Mitchell at CG Hospital.

Date	Sample	Volume ml	Amino levulinic		Porphyrins	
			mg/liter.	mg/24 hr	mg/liter	mg/24 hr
6/19/71	spot	--	10.5	--	.360	--
	15 hr.	520	9.4	--	.300	--
6/20/71	spot	--	3.4	--	.110	--
	24 hr.	1675	5.2	8.7	.220	.369
6/21/71	spot	--	2.9	--	.065	--
	24 hr.	1500	2.8	4.2	.085	.128
6/22/71	spot	--	3.2	--	.125	--
	24 hr.	1652	2.6	4.3	.125	.206
6/23/71	spot	--	3.0	--	.130	--
	24 hr.	1800	2.2	4.0	.090	.162
6/24/71	spot	--	3.6	--	.115	--
	24 hr.	1500	2.4	3.6	.070	.105
*Treatment ended - 8:00 ^{AM} 6/24/71						
*Note - Treatment herein mentioned is for lead complexing and elimination only.						

KE 0005372

Resume and Interpretation of the Findings with Respect to Lead, on Examination,
as Reported by Kettering Laboratory

[REDACTED] was admitted to the Cincinnati General Hospital on June 15th 1971, for an investigation of his condition pursuant to a definitive diagnosis, if possible. He was seen and interviewed at some length, some days later, by the undersigned, for the purpose of establishing, as clearly as possible, the nature, duration, and relative severity of his exposure to lead in the course of his work at the Granite City industrial establishment of National Lead Company. The interview was intended also to provide the information on which the further investigation of his status, with reference to the extent of his present body burden of lead, could be based.

The interview resulted in the conclusion that this patient's exposure to lead had been quite severe during the early period of his employment from 1951 to 1964 (which was interrupted by military service for about 2 years, beginning in 1952 and ending in 1954, and also by about 2 months (laid off) in 1951. He became ill in 1964 and was sent to St. Elizabeth's Hospital in Granite City, where he remained for 2 weeks, after which he returned home for 6 weeks and then returned to work. where on the advice of his private physician, he was given the job (presumably involving little or no exposure to lead), of sweeping. (Note. The nature and location of this job was not described in such a manner as to enable the interviewer to determine whether it was in fact free, substantially, of lead exposure. It is very doubtful that such was the case. RAK). He was unable to continue at this work because of his severe disability, but he alleges that he persisted in the effort to do so as long as possible, because of the needs of his family (wife and 7 children). He was sent to the Veterans Hospital in St. Louis in June of 1969, after having attended the out-patient facility at that hospital for some weeks previously. (The concentration of lead in the blood of this man (0.077 mg. per 100 ml.) in his stay at Veterans Hospital (7-28-69) is sufficient reason for doubting his freedom from exposure to lead in the later years of his work for National Lead Co.).

On this background of information, the 5-day course of administration of Na_2Ca EDTA was advised and carried out. This was intended not as therapy for his present illness, but as a means of eliciting a response which would tend to reveal his status as to his body burden of lead. His initial findings, prior to the administration of Na_2Ca EDTA were: concentration of lead in blood - 0.060 mg. per 100 grams of whole blood; concentration of lead in urine (spot specimen) - 0.10 mg. per liter, large specimen, 0.12 mg. per liter; concentration of porphyrin and -aminolevulinic acid (ALA) in the urine, at this time, in spot specimens - 0.360 mg. and 10.3 mg. per liter of urine, respectively, and in larger specimens, 0,300 mg. and 9.4 mg. per liter of urine, respectively

These findings, with the patient in a resting (unmedicated) state, are all abnormally high, and are, in themselves, indicative of an unusual quantity of lead in the tissues of this patient. In addition, the findings, at this same time, with respect to the elevated concentrations of the precursors of hemoglobin in the blood, while not necessarily associated with the presence of anemia, are indicative of a biochemical activity of lead in the body, which is characterized, functionally, as an inhibition of the activity of enzymes associated with the production hemoglobin. The increases in the concentration of these hemoglobin precursors in the urine, especially that of ALA, go hand in hand with the elevation of the concentrations of lead in the blood.

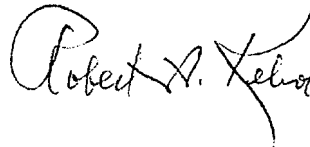
KE 0005073

N 7444.06

The subsequent progressive trend toward decrease in these concentrations, as a group, following the administration of $\text{Na}_2\text{Ca EDTA}$, is an effect of chelation therapy, as it proceeds, which is characteristic, and illustrative of the foremost benefits (presumably) of chelation therapy. The first day of therapy yielded a response* which is rarely seen, except in association with recent, severe exposure to lead. These results, taken together are clearly indicative of a present significant abnormality in this patient (even after the long interval between the cessation of work and the date of the therapy), with respect to the general order of the quantity of lead which has been retained in his body.

These observations do not indicate or even suggest, necessarily, that this patient is suffering, in any way, from any present deleterious effects of his undue absorption of lead. What it does indicate is that such present effects as cannot be explained by other factors of illness may be due, in part, at least, to the presence of abnormal quantities of lead in his body. This conclusion, of course, is subject to interpretations based upon experience and judgment.

Robert A. Kehoe, M.D.



July 7, 1971

* in terms of the concentration (and calculated output) of lead in the urine.

KE 0005074