Notes and Miscellanea

Diagnostic Sodium Calciumedetate Mobilization Test in Ambulant Patients

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The urinary lead excretion of 41 healthy subjects was compared before and three and six hours after the injection of sodium calciumedetate. All subjects showed a marked rise in lead excretion after the injection. The mean value $\pm$ 2 S.D. was calculated. The authors consider that this method, which does not require hospitalization, is of value in the diagnosis of contact with lead.

The lead mobilization test with the injection of sodium calciumedetate has become a routine test in the early detection of lead poisoning. Since Albahary and his co-workers (Desoille, Albahary, Truhaut, and Boudène, 1958) introduced this technique, many authors have been able to demonstrate slight lead absorption before any clinical symptom has appeared. Foreman, Finnegan, and Lushbaugh (1956) and Bastenier, Deslypere, and De Graef-Millet (1958) have shown that almost 90% to 95% of the injected sodium calciumedetate is excreted within the first six hours after the injection. Roche, Badinand, and Lejeune (1960) also showed the value of the sodium calciumedetate test performed during hospitalization. The lead content was measured in urine collected over 24 hours.

In the Voorzorgsfonds ten behoeve van door beroepsziekten getroffen en, however, it is impossible to hospitalize patients who need to undergo diagnosis and evaluation of their working capacity in connexion with an occupational disease. It became necessary, therefore, to develop a lead mobilization test for ambulant patients.

To standardize the method and determine to what extent the lead content of normal subjects fluctuates, we selected 41 healthy adults who had no known or environmental contact whatever with lead or lead compounds. None of these subjects showed any clinical symptom of lead poisoning.

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Method

At about 9 a.m. a urine sample (sample I) is taken from each subject and the lead content is determined according to the dithizone method described by Fister (1950). After this sodium calciumedetate, 1.2 mg./kg., diluted in lead-free saline is injected intravenously and the subject is requested to drink 300 ml. of water. Urine is collected three (sample II) and six (sample III) hours after the injection. After mineralization of 5 ml. of each sample, the lead content is determined as in sample I.

Results

As shown in Table I, our results showed a wide range—in the first sample from 0 to 104 γ lead per litre. Three hours after sodium calciumedetate injection, the highest lead content of the urine rose to 1,625 γ per litre, and after six hours to 2,464 γ per litre. The results, together with the mean values, are summarized in Table II. About 96% of the results are less than the mean value $\pm$ 2 S.D.

Conclusion

We may conclude that a urinary lead excretion of approximately more than 80 γ per litre before sodium calciumedetate injection or exceeding 1,500 γ per litre three hours after injection or 2,000 γ per litre six hours after injection must be considered as abnormal, and that it suggests the diagnosis of contact with lead. This simple test may be of value in the routine detection of lead absorption.

TABLE I

LEAD CONTENT OF URINE BEFORE AND AFTER
SODIUM CALCIUMEDETATE INJECTION

Subject	Sample I (before) (γ /litre)	Sample II (3 hours after) (γ /litre)	Sample III (6 hours after) (γ /litre)
1	30	1,500	960
2	30	1,120	1,033
3	29	200	340
4	32	1,060	300
5	46	1,030	1,480
6	70	1,625	1,700
7	45	415	430
8	62	880	336
9	26	755	1,240
10	10	1,150	2,235
11	44	540	540
12	26	650	1,320
13	25	344	492
14	50	890	1,500
15	10	1,560	1,760
16	50	730	1,520
17	54	520	750
18	16	350	84
19	56	1,034	810
20	48	732	944
21	23	280	676
22	36	1,024	1,192
23	80	580	480
24	30	230	205
25	36	630	968
26	20	480	375
27	10	504	640
28	38	416	568
29	18	1,010	532
30	74	400	536
31	22	809	1,440
32	50	1,184	2,464
33	18	620	464
34	53	750	1,440
35	16	596	628
36	62	694	950
37	27	1,330	1,700
38	62	910	1,436
39	34	770	400
40	104	1,220	690
41	0	1,240	456

TABLE II

LEAD CONTENT OF URINE BEFORE AND AFTER
SODIUM CALCIUMEDETATE

Lead Content (γ /litre)	Sample I (before)	Sample II (3 hours after)	Sample III (6 hours after)
Lowest value ..	0	200.0	84.0
Highest value ..	104.0	1,625.0	2,464.0
Mean value (M)	38.3	799.1	927.2
Standard deviation (S.D.)	21.7	366.1	569.4
M + 2 S.D. ..	81.7	1,531.0	2,066.0

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