Journal of Advancement in Medicine
Volume 3, Number 3, Fall 1990

Intravenous EDTA Infusion and the Hemogram

Hugh D. Riordan, MD, Emanuel Cheraskin, MD, DMD, Marvin Dirks, BD, MA, and Maurice Tinterow, MD, PhD

ABSTRACT: This paper reports the hemogram (complete blood count) in 25 adults before and after EDTA chelation therapy. Treatment included 20 EDTA infusions (3 g, with magnesium and ascorbate) 1 to 2 weeks apart, plus a modest nutritional supplement. There were no clinically significant changes in hematological parameters, and thus no evidence of harm from EDTA therapy, as judged by these laboratory studies.

Introduction

Concerns about the safety of IV therapy with EDTA (ethylenediaminetetraacetic acid) center on possible nonspecific metabolic upheaval, renal compromise, and generalized demineralization (1,2). If any of these effects occurred significantly, hematologic changes might be expected. We report here the hemogram (complete blood count) in 25 subjects before and after 20 treatments with IV EDTA (spaced 1 to 2 weeks apart). These subjects participated in a study of EDTA chelation therapy for hypertension in the presence of slightly elevated body burdens of lead and cadmium. Lead and cadmium excretions were enhanced, but no reduction in blood pressure was found (3).

All authors are affiliated with The Center for the Improvement of Human Functioning International, Inc., 3100 North Hillside Ave., Wichita, Kansas 67219 U.S.A. Reprint requests should be addressed to Hugh D. Riordan, MD. The EDTA used in this study was generously donated by The Key Co., St. Louis, Missouri. Telephone number for senior author: (316) 682-3100.

Methods

Twenty-five hypertensive subjects were selected and treated as fully described previously (3). Briefly, they had a mean blood pressure of at least 140 mm systolic or 90 mm diastolic, were over age 40, had normal creatinine clearance, and showed at least a 5-fold increase in 24-h urinary excretion of lead or cadmium following a challenge infusion of EDTA. Twenty infusions, each containing 3 g EDTA, 15 g ascorbate, and 800 mg magnesium chloride, were given over 3 to 5 h at intervals of 1 to 2 weeks. The average duration for 20 treatments was 31 weeks. A broad spectrum, multivitamin and mineral supplement was provided (Bronson Insurance Formula). Blood samples were analyzed by a local reference laboratory.

Results

Table 1 shows 13 hematologic parameters assessed before and following treatment. Also shown are the normal ranges used by the laboratory and the numbers of individual values falling outside those ranges.

Three hematologic parameters showed statistically significant changes in their means following treatment. Mean corpuscular volume (MCV) increased by 1%, basophil fraction increased by 7%, and platelet concentration increased by 20%. These small changes might be favorable, because they all brought the group means closer to the middle of the normal range.

Discussion

Regarding the values outside the normal range, there were 8 before treatment and 15 afterwards, or 2.4% and 4.6%, respectively. Neither incidence exceeds that which might be expected in any population (about 5% for $\pm$ 2 SDs).

Examination of the 15 post-treatment values falling outside the normal range suggests that they do not imply toxic effects of EDTA. All 4 of the outside values associated with iron status (RBC, hemoglobin and hematocrit), for example, are on the high side, contrary to any expectation of harm from EDTA. They also differ only slightly from the normal range, by 0.4% to 6%. Three of the 4 elevations occurred in one individual and probably signify nothing more than a slight dehydration at the time of the blood sample. Elevation of these 4 values is contrary to what might be expected if EDTA inhibited

TABLE 1

Hematologic Parameters Before and After 20 Treatments with 3-gram Intravenous EDTA Infusions in 25 Subjects (mean ± SD, no. of values outside the laboratory's normal range).

Test	Before Treatment		After Twenty Treatments		"Usual Range"
WBC, 10^3/mm^3	6.5 ± 1.3	0	6.5 ± 1.4	0	4-10.5
RBC, 10^6/mm^3					
Males (n = 12)	5.3 ± 0.2	0	5.4 ± 0.3	0	4.3-5.9
Females (n = 13)	4.8 ± 0.3	0	4.7 ± 0.4	1	3.5-5.5
Hemoglobin, g/dl					
Males (n = 12)	15.2 ± 0.8	1	15.6 ± 1.1	0	13.9-18
Females (n = 13)	13.8 ± 0.9	0	13.6 ± 1.1	1	12-16
Hematocrit, %					
Males (n = 12)	46.5 ± 2.1	0	47.8 ± 3.3	1	39-55
Females (n = 13)	41.7 ± 2.5	0	41.6 ± 3.6	1	36-48
MCV, 10^{-9} mm^3	87.9 ± 2.7	0	88.7 ± 3.0*	0	80-100
MCH, 10^{-12} g	28.9 ± 1.5	0	29.0 ± 1.3	0	26-34
MCHC, %	32.9 ± 0.9	0	32.7 ± 1.0	0	31-37
Neutrophils, %	58.8 ± 6.3	0	58.9 ± 8.3	2	45-75
Lymphocytes, %	32.2 ± 6.5	2	31.0 ± 8.4	4	20-45
Monocytes, %	4.6 ± 1.1	0	5.0 ± 1.6	0	0-10
Eosinophils, %	3.7 ± 1.8	3	4.3 ± 2.1	4	0-6
Basophils, %	0.7 ± 0.3	0	0.8 ± 0.3**	0	0-2
Platelets, 10^3/mm^3	258 ± 75	2	272 ± 76**	1	150-500

* P = 0.03, ** P = 0.01; statistically significant different mean by paired t-test (2-tailed).

RBC production in any of the following ways: suppression of bone marrow, depression of kidney production of erythropoietin, shortening of RBC survival, disruption of iron recycling from senescent RBCs, impairing transport of iron from storage sites, or interrupting RBC production due to primary deficiencies in either iron or copper.

The post-treatment outside values of neutrophil and lymphocyte

percentages were trivial; the absolute counts were all within the normal range.

In summary, on the basis of the indices studied, the described EDTA treatment appears to have no significant effect on basic hematologic functions.

These findings are in line with previous evaluations of the safety of EDTA infusion therapy. When given according to guidelines of the American College of Advancement in Medicine (4), this therapy shows no harmful effects revealable by serum creatinine (5,6) or by blood urea nitrogen (7), or here, by the hemogram.

Other publications from the research described here reported no significant loss of nutrient minerals (3), no harm to renal function (8), undisturbed chemical profile (9) and improved clinical symptomatology (10).

References

1. Jones RJ. Chelation therapy. JAMA 1983; 250:672.
2. Oliver LD, Mehta R, Sarles HE. Acute renal failure following administration of ethylenediaminetetraacetic acid (EDTA). Tex Med 1984;80:40-42.
3. Riordan HD, Cheraskin E, Dirks M. Mineral excretion associated with EDTA chelation therapy. In press, J Adv in Med.
4. Cranton EM, ed: Protocol of the American College of Advancement in Medicine for the Safe and Effective Administration of EDTA Chelation Therapy. J Adv in Med 1989;2:269-305.
5. McDonagh EW, Rudolph CJ, Cheraskin E. The effect of EDTA chelation therapy plus multivitamin-trace mineral supplementation upon renal function: A study in serum creatinine. J Holistic Med 1982;4:146-151.
6. Sehnert K, Clague AF, Cheraskin E. The improvement in renal function following EDTA chelation and multivitamin-trace mineral therapy: A study in creatinine clearance. Med Hypotheses 1984;15:301-304.
7. McDonagh EW, Rudolph CJ, Cheraskin E. The effect of EDTA chelation therapy plus supportive multivitamin-trace mineral supplementation upon renal function: A study in blood urea nitrogen. J Holistic Med 1983;5:163-171.
8. Riordan HD, Cheraskin E, Dirks M, Schultz M, Brizendine P. Another look at renal function and the EDTA treatment process. J Orthomol Med 1987;2:185-187.
9. Riordan HD, Jackson JA, Cheraskin E, Dirks M. The effects of EDTA infusion on the multichemical profile. Am Clin Lab 1988;20:42-43.
10. Riordan HD, Cheraskin E, Dirks M, Tadayon F, Schultz M, Brizendine P. EDTA chelation/hypertension study: clinical patterns as judged by the Cornell medical index questionnaire. J Orthomol Med 1989;4:91-95.