Cardiovascular Dynamics and EDTA Chelation with Multivitamin/Trace Mineral Supplementation

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Abstract

This report is a study of a series of geriatric patients afflicted with common chronic problems unsucessfully managed in other clinics. The evidence from this report shows clearly that ethylenediami-netetraacetic acid (EDTA) and multivitamin/trace mineral supplementation (MVTMS) significantly improve the circulation in the lower extremities as well as in the cephalic circulatory tree. Additionally, there is suggestive evidence that this same therapeutic regime can favorably alter the cardiac conductive system.

Introduction

In an earlier publication,[1] an attempt was made to describe previously not generally known clinical consequences of EDTA chelation along with multivitamin/trace mineral supplementation (MVTMS). Within the limits of those studies, the evidence suggests that, even in the absence of obvious lead or other heavy metal intoxication, interesting and possibly practical benefits were observed. The data in that report suggested that just about every cell, tissue, organ, system, and site disclosed desirable changes following this form of therapy.

This report directs attention to the possible physiologic potential of this same form of therapy as it relates to changes in circulation directly and indirectly as evidenced in the electrocardiogram.

Review of the Literature

Bernstein and his contributors[2] in their monumental test, *Noninvasive Diagnostic Techniques in Vascular Disease,* make four cogent points. First, noninvasive diagnostic instrumentation and interpretation have now reached a state of excellence in routine clinical practice. Second, some of the procedures are not only highly accurate but simple enough for use in a general medical atmosphere. Third, of all available single noninvasive diagnostic techniques, the ankle/brachial Doppler systolic blood pressure ratio is probably one of the most preferred. Lastly, noninvasive diagnostic and predictive measurements can reliably monitor results of therapy, both surgical and medical.

As far as we can ascertain, one of the experiments to be described in this document is the first reported attempt to study the effect of EDTA chelation upon vascular dynamics, as measured by the ankle/brachial Doppler ratio.

Method of Investigation

The data for this study were obtained from the same sources previously described in the paper dealing with clinical consequences of EDTA chelation and MVTMS[1] The studies accomplished at the McDonagh Medical Clinic will be referred to as Group I; the data from the Garvey Center as Group II.

Apropos, to the McDonagh Medical Clinic, two studies are reported. The first includes 117 lower extremities in 77 elderly patients with documented occlusive peripheral vascular stenosis, diagnosed by the Doppler systolic ankle/brachial blood pressure ratio (Group Ia).[3] The second project consists of 57 patients who were evaluated for cerebral vascular arterial occlusion (Group Ib).[4]

Group II consists of 28 hypertensive subjects analyzed at the Garvey Center.[5]

The therapeutic regime has already been previously described in some detail.[1] Ankle/brachial Doppler systolic blood

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pressure ratios were measured at the beginning and the end of the study (Group Ia) utilizing a Parks Model 806-C Directional Doppler (Parks Electronic Laboratory, Beaverton, Oregon). A course of treatment lasted an average of 60 days per patient. Therapy included a mean of 26.2 ± 8.1 infusions of 3 g EDTA, along with supportive MVTMS. All subjects demonstrated an initial ankle/brachial ratio < 1.0. This cutoff point was used because it is generally accepted that the "normal" ankle/brachial ratio is 1.12[6] and that values lower than 0.97 should be considered abnormal.

Supportive MVTMS was tailored to each patient's needs, based on biochemical and clinical evaluation. Dosages for water soluble vitamins C and B complex were on the order of ten times the Recommended Daily Allowance (RDA), while other vitamins, minerals and trace elements were supplemented in approximate RDA amounts.

All circulatory measurements were performed at rest, in the supine position, because the evidence suggests that, under these conditions, Doppler systolic blood pressure measurements provide a sensitive index of arterial occlusion.[7] [8]

In Group Ib, 57 routine patients participated. Included were 34 males age range from 23 to 82 years old with a mean and standard deviation of 60.4 ± 11.2; 23 females from 48 to 77 years with an average and standard deviation of 60.2 ± 7.8.

At the initial examination, each patient underwent a detailed history, physical examination and comprehensive battery of biochemical tests. Additionally, all subjects underwent oculocerebrovasculometry (OCVM), an unique noninvasive tonome-tric system for the detection of arterial insufficiency (stenosis). This technique was developed in cooperation with Maurice Langham, Ph.D., of the Wilmer Institute at the Johns Hopkins University School of Medicine.[9] [10] This noninvasive system simultaneously measures intraocular pressure and ocular pulse in both the undisturbed state and with the eye pressure increased to the ophthalmic arterial pressure. The procedure measures the ophthalmic arterial pressure which, when compared to the brachial blood pressure, provides a reasonably accurate method of assessing carotid artery occlusive disease, cerebrovascular occlusive disorders, and ocular vascular pathology.

The 28 people, who were the subjects for Group II,[5] were systematically drawn from 127 volunteers who responded to a newspaper and/or television ad requesting the participation of people who fit certain criteria previously reported.

For purposes of this study, attention is directed to the duration of the QRS complex as measured in the standard three limb leads. A Hewlett Packard Model 476A Cardiograph was used for data gathering.

Results

Line 1 of Table 1 summarizes ankle/ brachial Doppler systolic blood pressure ratios at the start of the experiment for Group Ia. Because only those patients with a ratio < 1.0 were selected, it is evident (mean 0.77 ±0.22) that all subjects suffered with arterial insufficiency (the range was from 0.00 to 0.99). Following EDTA chelation therapy (line 2), the ratio increased (mean 0.94 ± 0.27, range from 0.43 to 1.59). *Subsequent to an average of approximately 26 infusions of EDTA per patient, extending over approximately 60 days, the ankle/brachial index increased an average of 22%, indicating an improvement in arterial blood flow. This is highly significant statistically (t = 8.0041, p < 0.001).* The significance of this result is supported by other studies which indicate that a change in the ankle/brachial index of 15% or more is significant, while a difference of 10-15% is of borderline significance. Of the 117 limbs studied, 95 (81%) improved, 22 (19%) worsened. Phrased another way, 95 limbs improved an average of 29% and 22 limbs worsened for a mean of 10%.

Considering the wide range of initial ratios, indicating that some patients were suffering with more and others less stenosis, the entire sample of 117 limbs was divided into two subgroups. One subset of 46 measured an average initial ratio of < 0.80. This is designated as the "poorer" group; the other 71 demonstrated a starting ratio of > 0.80 and is labelled the "better" subset.

Line 3 of Table 1 summarizes the average

beginning scores of the poorer group (0.55 ± 0.19). Line 4 shows the final average values (0.71 ± 0.25) of these same patients. Thus, in those with more severe occlusion, the ankle/brachial index (reflecting arterial blood flow) improved an average of 29%, which is highly statistically significant ($t = 3.997$, $p < 0.001$). To subdivide this group even further, 33 patients (71%) improved and 13 patients (29%) worsened. *The 33 patients improved an average of 46% and the 13 less fortunate persons worsened by an average of 11%.* Some individuals had systolic ankle/brachial pressures below 50 mm Hg, which incidentally is the limit below which gangrene may be expected[11] and all such patients experienced clinical improvement.

In the relatively healthier group of 71 patients, the average initial index (line 5) was 0.91 ± 0.17. This was an average of 19% improvement, which is highly significant statistically ($t = 8.9790$, $p < 0.001$). Actually, 62 of the 71 patients (87%) improved while 9 patients (3%) worsened. *Put another way, 62 patients improved an average of 23% and 9 patients worsened 10%.*

In addition to this just-described lower extremity study (Group Ia), an experiment was done on another group of patients (Group Ib). Each of these subjects received a series of intravenous disodium EDTA infusions with a mean and standard deviation of 28.4 ± 7.7 (ranging from 10 to 46). Additionally, MVTMS was supplied as previously described. Upon completion of the EDTA and MVTMS series, each individual once again received a comprehensive history, physical examination, battery of biochemical tests and oculocerebrovascu-lometry.

Five points deserve particular consideration. First, the mean value of arterial stenosis was 28% with a range from 3 to 74 (line 4, Table 2). Following therapy, the average score decreased to 10% with a spread from 0 to 54. Hence, there was an overall statistically significant reduction in arterial occlusion of 18% ($t = 7.1931$, $p < 0.001$). Second, with advancing age, there is a progressive increase in vascular insufficiency at the initial examination from 23% in the youngest age group (line 1) to 32% *in* the oldest (line 3). Third, following treatment, at every temporal point, there is a significant mean reduction in stenosis of an order of l8% ($t = 5.3516$,$p<0.001$), 22% ($t = 5.2566$, $p<0.001$), and 15% ($t = 2.6147$, $p < 0.025$) respectively. Fourth, not shown in the Table, of the total of 57 patients, 50 improved clinically and 7 worsened. Thus, approximately 88% of the patients improved. Finally, these observations were made possible with a relatively simple, noninvasive instrument and technique, oculocerebrovasculometry (OCVM).

Table 3 (Group II) summarizes the electrocardiographic findings in the 28 subjects before therapy and following 10 and 20 treatments. Indicated in this chart are the minimum and maximum scores, the means and standard deviations.

When the initial QRS durations are compared to those after 10 and 20 infusions, there are statistically significant improvements between the initial scores and the latter two points ($t = 2.5$, $p = .02$, $t = 2.9$, $p = .01$). In contrast, there are no statistically significant differences when the data from infusion 10 is compared solely to that of infusion 20 ($t = .38$, $p = .71$).

Discussion

On a more positive note, it is interesting that, within the limits of these studies, one can significantly and favorably alter cardiovascular state. This is borne out in the ankle leg studies as well as the carotid eye experiments. This is further emphasized with the electrocardiogram.

If, as the literature suggests, the shorter the QRS duration, the better the myocardial health, then the experience here described with EDTA is potentially beneficial and clearly not harmful to the myocardium, as indicated by the QRS interval. This conclusion seems reasonable, as indicated by the progressive reduction.

What is especially interesting is the fact that these results were obtained by nonsurgical means. Parenthetic mention should be made that there is very little in the literature on this subject except for isolated mention of circulatory improvements with clofibrate.

While it is certainly clear that these changes did indeed occur, it is still unclear as to the mechanism. One must still raise the question as to whether the effects

Table 1

Effect of EDTA chelation therapy with vitamin/mineral supplementation upon ankle/brachial systolic pressure

line		sample size	ankle/brachial pressure	mean percentage change	significance of the difference of the means	
1	initial	117	0.77 ± 0.22			
				+22	t = 8.0041	p< 0.001*
2	final	117	0.94 ± 0.27			
3	initial lower (poorer) ratio < 0.80	46	0.55 ±0.19			
				+29	t = 3.9771	p< 0.001*
4	final lower (poorer) ratio < 0.80	46	0.71 ±0.25			
5	initial higher (better) ratio 0.80+	71	0.91 ± 0.06			
				+19	t = 8.9790	p< 0.001*
6	final higher (better) ratio 0.80+	71	1.08 ±0.17			

* statistical difference of the means

Table 2

Effect of EDTA plus multivitamin/ trace mineral therapy upon caratoid stenosis

line	age groups	sample size	before therapy	after therapy
1	23-58	20	23	5
2	59-64	19	31	9
3	65-83	18	32	17
4	entire	57	28	10

Table 3

Effect of EDTA plus multivitamin/trace mineral supplementation upon the QRS duration in Lead I

	before treatment	after ten treatments	after twenty treatments
sample size	28	28	28
minimum score	0.040	0.036	0.037
maximum score	0.113	0.113	0.111
mean QRS duration (sec.)	0.070	0.065	0.064
SD	0.020	0.019	0.018

recorded here were the results of EDTA infusions, multivitamin trace mineral supplementation, or a placebo effect singly or in combination.

Additionally, one must emphasize the fact that the studies reported here are the only ones. It would be highly desirable, and it is hoped that these studies will catalyze interest in further investigations along these lines.

Summary and Conclusions

The evidence from this report shows clearly that EDTA and MVTMS significantly improves the circulation in the lower extremities as well as in the cephalic circulatory tree. Additionally, there is suggestive evidence that this same therapeutic regime can favorably alter the cardiac conductive system.

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