Original Article

Serum Trace Elements (Se^{+2}, Cu^{+2}, Zn^{+2}) in Patients with Behcet's Disease

Ikbal Kh. AL-Joofy,*phD
Kalida M Mousawy** phD
Raad K. Muslih*** phD
Makram M. AL-Waiz***phD*

Summary:

Background: Extensive reports denote the biological role of trace elements (Cu^{+2}, Zn^{+2}, Se^{+2}) in many various physiological and pathological conditions, one of the list is shown to be Behcet's disease (BD).The aim of this study was directed towards the distribution of trace elements (Cu^{+2},Zn,$^{+2}$,Se^{+2}) in sera of BD patients, and control groups .

Methods: Fifty Arab Iraqi patients who fulfilled the ISG criteria for diagnosis BD.compared with 21 patients control with recurrent oral ulcer (ROU),healthy control groups (21healthy relative and 21healthy volunteer). Typing HLA Class I was carried out at Alkarama hospital, by using microlympho-cytotoxicity test. The concentrations of serum Cu^{+2}, Zn^{+2}, and Se^{+2} were determined by atomic absorption spectrophotometry.

Result: Variation in levels of these trace elements as significant (P < 0.001) in Cu+2concentrat and decreased (P<o.001) in Se+2 concentrate were clearly noticed in patients with BD in comparison to control groups.

Conclusions: Very unique striking results have come out of this study, and that is the significant increase in Cu^{+2} level, significant decrease in Se^{+2} level, with non significant decrease in Zn^{+2} level, were clearly observed in the patients studied groups in comparison with control groups.These results is another additional explanation to increase joint involvement occurrence in those patients (our further documented results).

Key words: Behcet's disease , trace element, Selenium, copper, Zinc .

Introduction

Despite extensive researches, the etiology of Behest's disease remained mysterious, though evidences had accumulated that genetic, environmental, hormonal & immunological mechanisms do play a crucial role in the development of this disease[1,2,3,4]. Different trace elements take part in a lot of enzymatic systems affects immunological responses and antioxidant defenses. They have either pro or anti inflammatory actions[5,6].

Extensive reports denote the biological role of trace elements such as (Cu^{+2}, Zn^{+2}, and Se^{+2}) in many various physiological and pathological conditions[7,8,9], one of the list is shown to be BD, where Se^{+2} might affects some many immune elements in patients with this disease[10], hence its deficiency might impedes the humoral immune response[10].

For these reasons the aim of this study was directed towards the distribution of trace elements (Cu^{+2},Zn,$^{+2}$,Se^{+2}) in sera of BD patients, and control groups .

Subjects & Methods

Subjects

This study comprises the following groups:

A.   Patients group (P.)

A total of 50 Arab Iraqi patients who fulfilled the international study group criteria for diagnosis BD, while

*Department of Biology, College of Science Al-mustansiriyah University
**Department of Microbiology, College of Medicine Baghdad University
***Department of Chemistry, College of Science Al-mustansiriyah University
****Department of Dermatology & Venereolog Baghdad University

attending the multiscipline Behest's disease Clinic at Baghdad Teaching Hospital.

B. Control groups

They were age, sex, matched with patients group. They were including:

- Patients Control(P.C.), which include 21 patients with ROU only
- 21 healthy relative (R).
- 21 healthy volunteer as healthy control (H.C.) group.

Methods

Typing HLA Class I was carried out at Alkarama hospital, by using microlympho-cytotoxicity test established by Terasaki (1964)12, and modified by Dick (1979) & Bender (1984), with wide range of antisera4.

The concentrations of serum $Cu+2$, $Zn+2$, and $Se+2$ were determined by atomic absorption spectrophotometry, the method was followed according to the manufactures instruction.

Statistical Analysis

Results were expressed as mean (M.) ± standard deviation (S.D.), the statistical difference between the mean of two groups was calculated by means of the student's t-test14.

Results

Statistical analysis showed that serum $Cu+2$ levels in the studied groups were significantly elevated ($P<0.01$, 0.001) in comparison to the H.C. group, with non-significant elevation ($P>0.05$) was observed in P.C. group as compared to the H.C. group. Moreover comparison between the studied groups (in the case of $Cu+2$ levels) showed significant differences ($P<0.05$, 0.001, 0.05, 0.001, 0.01 respectively), whereas non-significant different ($P>0.05$) was observed between P. HLA-B51(5) +ve vs. P. HLA-B51(5) –ve as presented in table 1.

The serum $Zn+2$ levels in the studied groups were non- significantly lower ($P>0.05$), with exception that significant decreased ($P<0.01$) in $Zn+2$ level in P. HLA-B51(5)+ve as compared to healthy control group. Comparison between the studied groups indicated a significant difference ($P<0.05$) between P. HLA-B51(5)+ve vs. P. HLA-B51(5)-ve, and R. group, and in contrast there was non-significant differences ($P>0.05$) between the rest of the studied groups as clearly shown in table 1.

In addition highly significant decrease ($P<0.001$) in the $Se+2$ levels in the studied groups, with exception of non-significant decrease ($P>0.05$) was shown in the P.C. group as compared to H.C. group. Also there was significant differences ($P<0.05$, 0.001, 0.05 respectively)

between P. HLA-B51(5)+ve vs. R., and P.C. , P. HLA-B51(5) –ve vs. P.C.

It was interestingly notice that significant elevation ($P<0.001$, 0.01, 0.001, 0.01, 0.05) was found in the Cu+/Zn+ ratio of the studied groups as compared with healthy control group, also significant difference ($P<0.001$, 0.01 respectively) between patients with hla-B51(5)-ve vs. R. & P.C., whereas non significant difference ($P>0.05$) was observed between the rest groups, as well demonstrated in table 1.

Finally results showed significant increase ($P<0.05$, 0.05, 0.01, 0.05, 0.05) in Cu+2/Se+2 ratio of the studied groups in comparison with healthy control group. Moreover significant difference ($P<0.01$, 0.001, 0.01) in Cu+2/Se+2 was observed between P. HLA-B51(5)+ve, and P. HLA-B51(5)-ve vs. P.C.. In contrast non significant difference ($P>0.05$) was observed between the other study groups, as well demonstrated in table 1.

Discussion

Very unique striking results have come out of this study, and that is the significant increase in copper level, significant decrease in selenium level, with non significant decrease in Zinc level, were clearly observed in most of the studied group as compared with healthy control, these results are comparable to the few studies abroad 15,16.

These results is another additional explanation to increase joint involvement occurrence in those patients4, since decrease in $Se+2$ level shown to affect so many immune elements in BD patients, specially in those with joint involvement and I patients with rheumatoid arthritis 5,11.

The ratio of these trace elements were observed to be differs in patient with BD, for instance $Cu+2/$ $Zn+2$, $Cu+2/Se+2$ ratios were significantly higher for patients than control which is comparable to the studies abroad.15,16

The reason for these unusual levels of trace element in patients is to be declared properly in a future work .

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Table1

: Serum Trace Elements (Cu^{+2}, Zn^{+2}, Se) in the Study Groups

Trace elements µg/ml	Study Groups						
	Total BD patients No.=50	Patients with HLA-B51(5)+ve N0.=28	Patients with HLA-B51(5) - ve No.=22	Relative No.=21	Patients control No.=21	Healthy control No.=21	Reference normal values (Range)
Copper Mean±S.D	***a 0.9913±0.181	***a 0.961±0.188	***a 0.953±0.162	**a 0.843±0.158	a 0.740±0.142	0.720±0.141	0.75-1.5
Zinc mean±S.D	B 0.582±0.147	**b 0.551±0.140	b 0.688±0.291	b 0.689±0.251	b 0.602±0.136	0.719±0.282	0.7-1.5
Selenium Mean ±S.D	***b 0.0284±0.007	***b 0.0276±0.0083	***b 0.0288±0.0087	***b 0.0307±0.0111	b 0.0381±0.143	0.0417±0.0021	0.046-0.143

a= increased , b=decreased

With healthy control t-test *P<0.05, **P<0.01, ***P<0.001

µg/ml

Comparison between study groups	Cu	Zn	Cu/Zn	Se	Cu/Se
P.HLA-B51(5)+ve vs. P.HLA-B51(5)-ve	N.S.	*b	N.S.	N.S.	N.S.
P.HLA-B51(5)+ve vs. R.	*a	*b	N.S.	*b	N.S.
P.HLA-B51(5)+ve vs. P.C.	***a	N.S.	N.S.	**b	**a
P.HLA-B51(5)-ve vs. R.	*a	N.S.	***a	N.S.	N.S.
P.HLA-B51(5)-ve vs. P.C.	***a	N.S.	**a	*b	***a
R. vs. P.C.	*a	N.S.	N.S.	N.S.	**a