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### Preliminary Study on the Changes of IgA/VcA Titers in Low Blood Selenium Persons<sup>1</sup> Sera by Oral use of Selenium-Enriched Yeast

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## PRELIMINARY STUDY ON THE CHANGES OF IgA/VcA TITERS IN LOW BLOOD SELENIUM PERSONS' SERA BY ORAL USE OF SELENIUM-ENRICHED YEAST

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**Abstract** Whole blood selenium (Se) concentrations in 112 IgA/VcA positive and 33 oral administrating Se-enriched yeast subjects and 32 IgA/VcA negative ones were determined, using 2,3-diaminonaphthalene fluorometric method modified by the author. The blood Se levels ( $\bar{x} \pm SD$ ) of IgA/VcA positive and negative subjects were  $0.115 \pm 0.024$ ,  $0.118 \pm 0.028$   $\mu\text{g/ml}$ , respectively, no significant difference was existed between their blood Se levels ( $P > 0.20$ ). The blood Se levels of low blood Se subjects with IgA/VcA positivity were  $0.104 \pm 0.009$ ,  $0.149 \pm 0.033$   $\mu\text{g/ml}$ , respectively, before and after oral use of Se-enriched yeast, there were significant differences between their blood Se levels ( $P < 0.001$ ). However, the efficiency of Se-enriched yeast on the negative change of IgA/VcA titer was only 21.4%. It suggested that blood Se levels are not related with IgA/VcA titers.

## INTRODUCTION

It has been reported that selenite and Se-enriched yeast were effective for the chemoprevention of alimentary tract cancers in the experiments,<sup>1-4</sup> but it is not known whether these Se compounds are effective for the chemoprevention of nasopharyngeal carcinoma (NPC). Epstein-Barr virus (EBV) is considered to be closely related with NPC, the IgA/VcA titers in sera of NPC patients and the individuals infected with EBV often present high positivity.<sup>5-6</sup>

Our purpose in the present study is an attempt to exploring the possible correlation between blood Se levels and IgA/VcA titers by determining the blood Se concentrations and IgA/VcA titers of low blood Se subjects, before and after oral administration of Se-enriched yeast, so as to find out whether the supplement of Se can negatively change the IgA/VcA titers.

## MATERIALS AND METHODS

Tablets of Se-enriched yeast, containing approximately 100  $\mu\text{g}$  Se per tablet, were purchased from Nantong Biochemical Pharmaceutical Co., Jiangsu Province, China. The IgA/VcA positive and negative blood samples were collected from persons who came to our Tumour Hospital for physical examinations. Se concentrations of the blood samples were determined by using 2,3-diaminonaphthalene fluorometric method modified by the authors.<sup>7</sup> The low or high blood Se subjects with IgA/VcA positivity were divided according to whole blood Se concentrations lower or higher than 0.110  $\mu\text{g}/\text{ml}$ . 28 cases of the low blood subjects and 5 cases of the high blood Se ones received 1 tablet of Se-enriched yeast daily, continuously three months. Their blood samples were collected and determined, 3 days after the completion of oral administration of Se-enriched yeast. Indirect immunoenzymatic test was used for the detection of EBV IgA/VcA antibody in the sera of each person.

## RESULTS

Whole blood Se concentrations in 112 IgA/VcA positive and 33 orally administrating Se-enriched yeast subjects and 32 IgA/VcA negative ones were determined, their blood Se levels were showed in table 1 and 2.

TABLE 1 The Blood Se levels of IgA/VcA positive and negative subjects  
( $\mu\text{g}/\text{ml}$ )

| Groups              | Cases | Range       | $\bar{x} \pm \text{SD}$ | t*    | P*    |
|---------------------|-------|-------------|-------------------------|-------|-------|
| A, IgA/VcA (-)      | 32    | 0.075-0.185 | 0.118 $\pm$ 0.028       |       |       |
| B, IgA/VcA (+)      | 112   | 0.081-0.188 | 0.115 $\pm$ 0.024       | 0.792 | >0.20 |
| C, IgA/VcA (+)      | 31    | 0.079-0.179 | 0.114 $\pm$ 0.026       | 0.514 | >0.50 |
| with titer<br>≥1:80 |       |             |                         |       |       |

\*As compared to IgA/VcA(-) group

Among 28 cases of low blood Se subjects with IgA/VcA positivity, there were 6 cases that their IgA/VcA positivity was changed into negativity, after Se-enriched yeast administration, the efficiency of Se-enriched yeast on the negative change of IgA/VcA was 21.4 %.

TABLE 2 The blood Se levels of the subjects receiving Se-enriched yeast ( $\mu\text{g/ml}$ )

|                                        | Low blood Se subjects<br>with IgA/VcA(+) | High blood Se subjects<br>with IgA/VcA(+) |
|----------------------------------------|------------------------------------------|-------------------------------------------|
| Cases                                  | 28                                       | 5                                         |
| Before receiving<br>Se-enriched yeast: |                                          |                                           |
| Range                                  | 0.084 – 0.110                            | 0.129 – 0.166                             |
| $\bar{x} \pm \text{SD}$                | 0.104 $\pm$ 0.009                        | 0.149 $\pm$ 0.014                         |
| After receiving<br>Se-enriched yeast:  |                                          |                                           |
| Range                                  | 0.099 – 0.217                            | 0.100 – 0.176                             |
| $\bar{x} \pm \text{SD}$                | 0.149 $\pm$ 0.033                        | 0.140 $\pm$ 0.027                         |
| F*                                     |                                          | 0.463                                     |
| t*                                     | 8.408                                    |                                           |
| P*                                     | <0.001                                   | >0.05                                     |

\*As compared to that before receiving Se-enriched yeast

## DISCUSSION

A trace element, Se is an essential nutritive component in human body, and also an important antioxidant that protects the cell membrane from damage of carcinogens.<sup>8-9</sup> The epidemiological study indicated that the incidence of cancer in some digestive organs as esophagus, liver and colon, etc, increased in humans in geographic regions where Se was deficient.<sup>10-12</sup> At the present it is not known whether the cause of NPC is related with Se-deficiency. Our environmental investigation presented that the blood Se levels of healthy local residents from NPC high and low risk areas were very similar, and the Se levels – in rice the main local food – were also similar.<sup>13</sup> It suggested that the cause of NPC seem not to be associated with the Se levels in the local environment.

In table 1, the blood Se levels ( $\bar{x} \pm \text{SD}$ ) of IgA/VcA positive and negative subjects were  $0.115 \pm 0.024$ ,  $0.118 \pm 0.028 \mu\text{g/ml}$ , respectively, no significant difference was existed between their blood Se levels ( $P > 0.20$ ). The blood Se level of IgA/VcA high positive (titer  $\geq 1:80$ ) was  $0.114 \pm 0.026 \mu\text{g/ml}$ , no significant difference was found as compared to that of IgA/VcA negative ones ( $P > 0.50$ ). It suggested that the blood Se levels are not related with IgA/VcA titers.

Although the blood Se levels of low blood Se subjects with IgA/VcA positivity increased to  $0.104 \pm 0.009$  to  $0.149 \pm 0.033 \mu\text{g/ml}$ , after Se-enriched yeast administration (Table 2), and there was a very significant difference as compared to that of IgA/VcA negative ones ( $P < 0.001$ ), their IgA/VcA titers had not been significantly changed. The blood Se levels of high blood Se subjects with IgA/VcA positivity were  $0.149 \pm 0.014$ ,  $0.140 \pm 0.027 \mu\text{g/ml}$ , respectively, before and after Se-enriched yeast administration. Using mean-square deviation method for comparing the above two blood Se levels, we had  $F = 0.463$ ,  $P > 0.05$ , there was no significant difference between their blood Se levels. In fact, the IgA/VcA titers of high blood Se subjects with IgA/VcA positivity were not changed, before and after receiving Se-enriched yeast. In other words, the blood Se levels of high blood Se subjects with IgA/VcA positivity were the same, and their IgA/VcA titers were not influenced, before and after Se-enriched yeast administration.

In table 2, 6 of 28 cases with the low blood Se showed a negative change of their IgA/VcA titers, after Se-enriched yeast administration. From this, we considered that oral administration of Se-enriched yeast was not much effective for negatively changing IgA/VcA titers of the low blood Se subjects.

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