

## References

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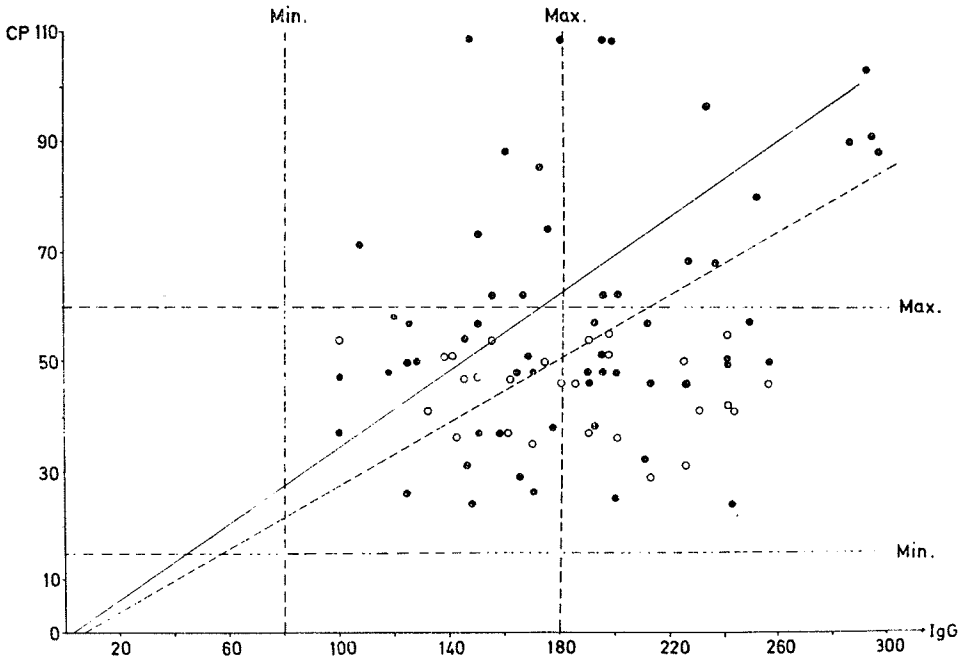


Figure 6- The correlation of Cp and IgG in patients and the control group.

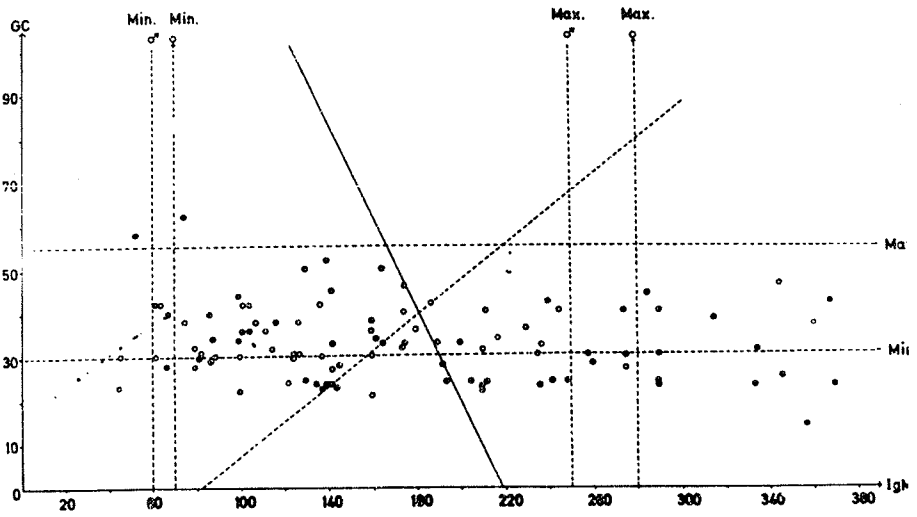


Figure 7- The correlation of Gc and IgM in patients and the control group.

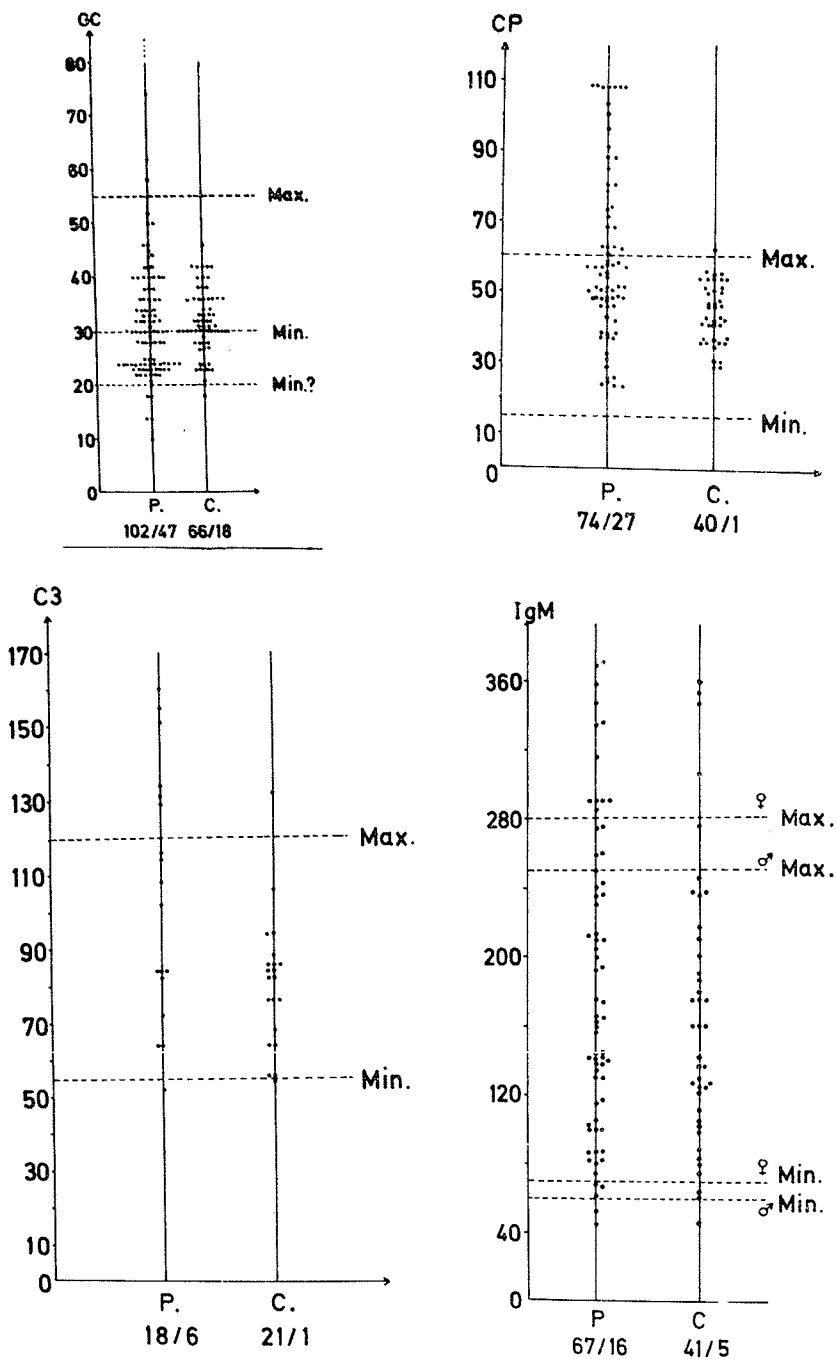


Figure 2-5- The serum levels of Gc , Cp , C3 and IgM in esophageal cancer patients and control groups.

Table 1 - Numbers and percentages of individuals with various levels of serum factors.

Samples Markers	Patients			Controls			X <sup>2</sup>	P
	Total	No. out of normal range	%	Total	No. out of normal range	%		
Gc	102	47	46.07	66	18	27.27	5.97	0.0145
Cp	74	27	36.48	40	1	2.5	16.2	0.0001
C3	18	6	33.33	21	1	4.76	5.37	0.0205
IgG	63	29	46.03	31	16	51.61	0.26	0.6106
IgA	66	4	6.06	38	1	2.62	0.38	0.5357
IgM	67	16	23.88	41	5	12.19	2.22	0.1365

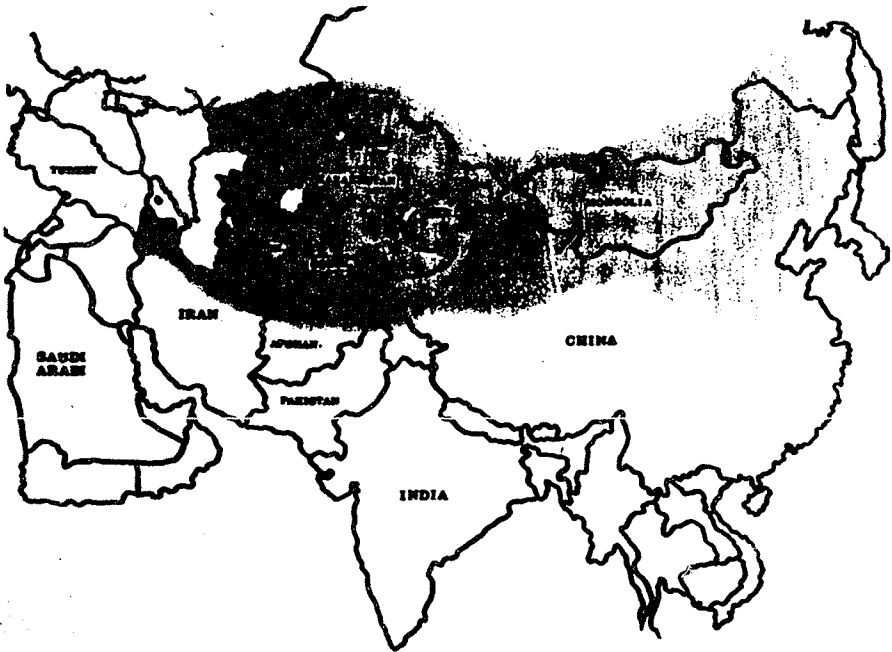


Figure 1 - Asian esophageal cancer belt

Correlation of each factor studied was established with each of the others. Cp versus IgG , figure 6 , shows that both patients and controls show positive and direct correlation. Gc versus IgM , fig. 7 , shows negative correlation between the patients and controls.

The existing literature , such as Med-line , in the past 10 years show very few similar studies , and hence , a comparison with other investigations and populations were not possible.

Obviously further investigations , with larger groups of patients and controls , can produce more comprehensive results.

### **Acknowledgement**

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## Materials and methods

Observations made in this study were based on serum from 102 patients with esophageal carcinoma , following laryngectomy , in comparison with 66 healthy individuals as control group from the same area. The materials were obtained by an active sampling in Gonbad area (north east of Iran) by a health survey through the School of Public Health , Tehran University of Medical Sciences.

The systems tested were Gc , Cp , C3 , IgG , IgA and IgM. The procedure of quantitative measurement was radioimmunodiffusion technique , with standard M partigen plates , provided by Behringwerke (2,4).

## Results and discussion

As shown in figure 2 , Gc values in the serum of 46.08% of the patients are under the standard minimum border line , and compared to only 27.27% of the controls showing this decrease , it is significant.

In figure 3 , Cp , the copper carrying protein , quantitative values show 36.49% over the standard maximum for the patients and only 2.5% in the controls, indicating a highly significant association between serum Cp level and esophageal carcinoma. Increase of copper in plasma causes a decrease in plasma retinol , and apparently , this effect helps the body to defend against certain carcinogens (5).

Figure 4 shows that 33.33% of the patients show increase of C3 , above the maximum range , but in controls only 4.76% show this increase. This significant increase means that the body's defense system is highly activated in these patients.

The activation of the immune system is confirmed also , as shown in figure 5 , in which 23.88% of the patients show an IgM concentration over the maximum range , but only 12.19% of the controls are over this range.

IgG and IgA serum concentration measurements , both in patients and control group , did not show valuable differences.

## Introduction

Esophageal carcinoma, with 95% of cases arisen from squamous epithelium and 5% adenocarcinomatous, causes progressive dysphagia for solids over several weeks and associated with marked weight loss. It may occur in any portion of the esophagus, but more often in the lower part, and may appear as a stricture, mass or plaque (7).

It is more frequent in the so called Asian esophageal cancer belt (figure 1), from the southern coastal areas of the Caspian sea, on the west, to northern China on the east, with high prevalence in Iran. Figure 1 also shows the geographical position of Iran and its areas with higher prevalence, in the cancer belt (1,7). In Iran, according to the 1988 statistics, cancer of esophagus is in third place, after cancers of skin and stomach (6,8).

It is more frequent in males, over 50 years old, and associated with lower socioeconomic classes. History of cigarette and / or opium smoking, chewing tobacco, alcohol consumption, carcinogens such as nitrites, fungal toxins in pickled vegetables, physical damage to the mucosa, such as drinking very hot tea (up to 40 cups per day), frequently used in this area, and oral hygiene are suggested to cause esophageal cancer (7). Soil constituents, natural flora, type of agriculture and climatological factors are said to have some effects, for example, the rainfall and the incidence have inverse correlation (1). However, genetic factors and racial origin have also been indicated as multifactorial inherited predispositions to cause the disease.

Some studies have shown different changes in serum proteins and immunoglobulins concentrations in patients with esophageal carcinoma (8). Hp, Tf, Gc, C<sub>3</sub> phenotyping have shown no significant difference in patients with esophageal carcinoma, compared with the controls (3). In the present study, an attempt is made to compare the serum concentrations of Gc, Cp, C<sub>3</sub>, IgG, IgA and IgM in patients with esophageal carcinoma following laryngectomy, with normal individuals.

## **STUDY OF Gc , Cp , C3 , IgG , IgA AND IgM LEVELS IN PATIENTS WITH ESOPHAGEAL CARCINOMA IN IRAN**

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**Key words:** *Esophageal cancer , immunoglobulins , serum proteins , Iran*

### **Abstract**

Quantitative serum level measurements of Gc , Cp , C3 , IgG , IgA and IgM were carried out on 102 patients with esophageal carcinoma following laryngectomy, in comparison with 66 healthy individuals as controls , in Gonbad area , north east of Iran. The procedure of radioimmuno-diffusion by standard M partigen plates , were used for the measurements.

A significant decrease was observed in Gc level in patients (P = 46.08%, C = 27.27%) (P=0.0145).

An increase was observed in serum IgM of patients (23.88%) in comparison with the controls (12.19%).

A significant increase was observed in C3 level (P = 33.33% , C = 4.76%) (P = 0.0205).

Highly significant increase , over the maximum level , was seen in serum Cp , the copper carrying protein , in patient (36.49%) in comparison with the controls (2.5%) (P=0.0001).

The measurements of IgG and IgA showed no difference between patients and cotrols.

The correlation coefficient of all factors were calculated and compared with each other. A positive value was observed between Cp and IgG of patients , as the increase of one is directly proportional to the increase of the other. Gc versus IgM in patients and controls showed negative correlation.

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