Importance of B₂ Microglobulin in Primary Bronchial Cancer

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Key Words
Bronchial cancer
B₂ microglobulin
Radioimmunoassay

Abstract
We have performed B₂ microglobulin determination in 18 non-cancer and in 38 cancer cases. We found a higher value in the control group in 11% (2 cases) and a pathologic value in 43.5% (17 cases) in the group of patients with primary bronchial cancer.

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Introduction
The B₂ microglobulin (Ehm) since its detection has been the center of interest. In normal conditions it can be found in serum and in urine in small quantity, but in some renal diseases its serum level and its excretion in the urine increases [1, 2, 3]. Very few papers deal with the correlation between the serum level of B₂m and various diseases, therefore we decided to examine this problem in bronchial cancer.

Material and Method
B₂m examination was carried out by radioimmunoassay: B₂ Phadebas micro test Pharmacia, Sweden. Investigations were performed on two groups of patients: patients without any malignant pulmonary diseases, the control group (CG), see table I and patients with primary bronchial cancer (CcG). Diagnosis was confirmed by cytology and/or histology in all cases. The extent of cancer varied on a broad scale. Before the examination the patients were not given any cytostatic or radiotherapy for a long time. In the case history of the patients there was no renal disease and the result of urine analysis was normal.

Table II. B₂m in values.

<table>
<thead>
<tr>
<th>Control group</th>
<th>Primary bronchial, cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
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<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
</tr>
<tr>
<td>2(11%)</td>
<td></td>
</tr>
<tr>
<td>17 (43.5 %)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
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</tbody>
</table>
Correlation between B2 Microglobulin Level and Age
We investigated correlation between the age of patients and the obtained values.
Results are represented in table III. In the control group with advancing of age the frequency of pathologic value was between 10–20%.
In the cancer group a correlation can be observed between the incidence of higher values and age; in the age group 30–50 we obtained a value higher than 2.3 mg/l in 16 cases and over the age of 61 the incidence was 64%.

Bi Microglobulin and its Correlation with Some Characteristics of the Disease
In patients with inactive TB or other lung diseases (1 sarcoidosis and 1 fibrosis with unknown etiology) there was no abnormal value. Out of 5 patients with active TB, one had abnormal value (this patient’s tuberculosis was very advanced), and among 7 cases with bronchitis one had high value (an 83 year old patient).

Table III. Correlation between B2 microglobulin and age.
Results
Results are presented in table II. The two groups can be separated very easily. The upper limit of the normal level was 2.3 mg/l; values exceeding this limit were considered as pathological. In the two groups we have got the following results: In the CG (18 patients) we found a value higher than 2.3 mg/l in two cases (11%). In the CcG (39 cases) 17 patients had a higher value (43.5 %).

Table I. Diagnosis of control group (no cancer cases)

Table IV. Correlation between length of case-history and B2m.

B2m level
Chronic bronchitis Active pulmonary tuberculosis Inactive tuberculosis Other pulmonary diseases
Total
7 5 3 3
18
Period of observation
0.5 month
5/8
Over 11 months
No. of patients
4/18
22%
5/8
62%
7/13
54%

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We also compared all other clinical data of patients with bronchial cancer to the value of Ikm. In table IV the time-period between the first clinical sign and the diagnosis is demonstrated. By relating the Bun level to the length of the case-history, the rapid or slow progression of the disease can be concluded.

It can be seen that there is a correlation between the time of observation and B2m level. The abnormal value was the lowest in the 0–5 months group.

We also investigated the correlation between histopathologic findings and Bun. High values were relatively seldom in microcellular type cancer (either it was not typified in cases, or it was another type). Table IV shows that in the group of those with the shortest case history the rate of high values was the lowest. We examined the number of microcellular cancer cases in this group. We found that out of 15 patients 8 suffered from microcellular carcinoma, while in the other groups (6–10 months) one in six patients, and (over 10 months) one in seven patients. (The figures only concern typified cases.)

Discussion
B2m has been recognised only recently and therefore there are very few papers dealing with the importance of this globuline and its function in diseases. In the past few years the structure of this globuline has been described. There are only hypotheses [2, 4, 5, 6, 7, 8] on its function and part, in immunological process. The observations carried out until now primarily concern renal diseases. The data of Nilsson et al. deserves attention pointing out that normal cells also produce Bun and there is only a small difference in their value. On the contrary, the difference in B2tn production of a different type of neoplastic cells is considerably larger [9].

Our examinations were performed in patients with primary bronchial cancer. It is known that in consequence of cancer, radical immunological alterations occur in the human organism.

Referring to our investigations, we demonstrate certain correlation between B2111 and other clinical data, as well as between age and serum level. Although in the non-cancer group the incidence of higher value was more frequent at advanced age, this correlation was more marked in the cancer group (table II).

We found further correlation to the period of case history (quick or slow progression of process) and to some histological types. The more the process spread and the histological type indicated microcellular carcinoma, the less the number of high B2m values were.

The number of our examinations is not yet sufficient to come to firm clinical conclusions. According to our data gained until now, higher B2m level values were more frequent in the group of patients with primary bronchial cancer than in the control group. Beyond that, certain correlation between the serum level changes of B2m and the data of primary bronchial cancer patients can be considered.

References