Clinical significance of serum tumor markers CA153, CA125, CA72-4 and FIB, IL-6 levels detection in ovarian cancer

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Objective: To investigate the clinical significance of serum tumor markers CA153, CA125, CA72-4 and FIB, IL-6 levels in the detection of ovarian cancer. Methods: A total of 40 patients with ovarian carcinoma treated in our hospital from September 2015 to June 2017 were selected as the ovarian cancer group; 40 patients with benign ovarian tumors in the same period were selected as the benign ovarian tumor group; 40 healthy subjects were selected as the control group. The levels of tumor markers CA153, CA125, CA72-4 and FIB, IL-6 were compared between the three groups. Results: The CA153, CA125, CA72-4 and FIB, IL-6 levels of the ovarian cancer group were significantly higher than those in benign ovarian tumor group and the control group; these levels in the benign ovarian tumor group was not significantly different from those in the control group. With the increase of clinical phase, the levels of CA153, CA125 and CA72-4 in patients with ovarian cancer were gradually increased, and the levels in phase III and IV were significantly higher than those in phase II and in phase I; and the CA125 in phase II was significantly higher than that in phase I. The levels of FIB and IL-6 in phase II and in phase III, IV were significantly higher than those in phase I; the IL-6 level in phase III, IV was significantly higher than that in phase II. Conclusion: Serum tumor markers CA153, CA125, CA72-4 and FIB, IL-6 levels for ovarian cancer detection can be helpful for clinical diagnosis and worthy of promotion.

1. Introduction

Ovarian disease is a common disease of gynecology; malignant ovarian cancer is seriously endangering female’s life, and the morbidity and mortality of ovarian cancer are high. Moreover, because of lack of early typical clinical symptoms of ovarian cancer, it is very difficult to diagnose and differentiate. Therefore, benign and malignant tumors usually need to be surgically confirmed, and often lead to the patient miss the optimal timing of treatment, hence, effective early diagnosis and identification are significant for prognosis and treatment of patients[1]. Serum tumor markers will be specifically expressed in tumor tissues, and different types of tumors usually induce the expression of different types of tumor markers, which has a positive reference value for the detection of malignant tumors[2]. Among them, carbohydrate antigen 153 (CA153), carbohydrate antigen 125 (CA125) and carbohydrate antigen 72-4 (CA72-4) are widely used in the auxiliary examination of ovarian cancer diagnosis. Plasma fibrinogen (FIB), interleukin-6 (IL-6) has also been reported to use for the detection of ovarian cancer[3-5]. In this paper, the levels of CA153, CA125, CA72-4, FIB and IL-6 in serum of ovarian cancer, benign ovarian tumor and healthy female were detected and explore its clinical value in the differential diagnosis of benign and malignant ovarian diseases.

2. Materials and methods

2.1. General data

A total of 40 cases of ovarian cancer patients admitted in our hospital from September 2015 to June 2017 were selected as ovarian cancer group, 40 cases of benign ovarian tumors admitted in our hospital in the same period were selected as benign ovarian tumor group, and 40 healthy women carried out physical examination as control group. Among them, the ovarian cancer group aged from
27-68 years old, with an average age of (39.4 ± 2.7) years old; pathological types included 22 serous tumors and 18 mucinous tumors. FIGO clinical staging criteria in 2009, pathological staging: 8 cases of stage I, 11 cases of stage II, 15 cases of stage III, 6 cases of stage IV. Ovarian benign tumor group: aged from 25-67 years old, with an average (38.8 ± 3.1) years old. Control group aged from 25-65 years old, with an average (39.1 ± 2.9) years old. All patients in ovarian cancer group and benign ovarian tumor group were carried out imaging, CT or MRI examination and diagnosed by pathological diagnosis. Blood samples were collected before treatment and were not treated with radiotherapy and chemotherapy before blood collection. Patients with heart, liver, kidney and other serious primary diseases were excluded, and patients who took other drugs, with infections in recent, suffering from mental illness before taking part in this study were also excluded. This study was approved by Medical Ethics Committee; patients and their families agreed to participate in the study and signed informed consent.

2.2. Indexes detection

All subjects were extracted 2 mL of fasting venous blood before treatment, anticoagulation (sodium citrate treatment) and centrifuged at 3000 rpm for 15 min. The levels of CA153, CA125 and CA72-4 were detected by automatic chemiluminescence immunoassay analyzer and its related reagents (Roche, Germany, batch numbers 150623, 150219 and 150328). FIB levels were measured by automatic hemagglutination analyzer (ACL-900). At the same time, subjects were collected 2 mL of fasting venous blood (dry without anticoagulant), using ELISA (Thermo company automatic microplate reader, and the kit was purchased from Beijing SaiChi Biotech Co., Ltd., batch number 150520 for detection of IL-6 Level.

2.3. Statistical processing

SPSS 18.0 statistical software was used to analyze and process the data of this study. In this study, serum tumor markers CA125, CA153, CA72-4 levels and FIB, IL-6 levels were in compliance with normal distribution, Mean ± SD the comparison among groups using t test. P<0.05 indicated significant difference, with statistical significance.

3. Results

3.1. Comparison of CA153, CA125, CA72-4 level in all subjects of three groups

The level of CA153 in ovarian cancer group (159.77 ± 65.41) U/mL was significantly higher than that in benign ovarian tumor group and control group. The CA125 level (305.84 ± 81.34) U/mL was significantly higher than that in benign ovarian tumor group and control group; CA-72-4 level (14.39 ± 6.01) U/mL was significantly higher than benign ovarian tumor group and control group; the difference was statistically significant (P<0.05). There was no significant difference in CA153, CA125 and CA72-4 levels in benign ovarian tumors (P>0.05), shown in Table 1.

3.2. Comparison of CA153, CA125, CA72-4 levels of ovarian cancer patients in different stages

The levels of CA153, CA125 and CA72-4 in patients with ovarian cancer gradually increased as the clinical stage rose. The levels of CA153 and CA72-4 in stage III and IV of ovarian cancer were significantly higher than those in stage I and II (P<0.05), while those levels in stage II were not significantly different from those in stage I (P>0.05). The level of CA125 in stages III and IV(403.62±171.03) U/mL of ovarian cancer was significantly higher than that of stage I and stage II (P<0.05). The level of U/mL in stage II (287.18 ± 103.02) U/mL was significantly higher than that of stage I (236.72 ± 98.54) U/mL (P<0.05), shown in Table 2.

3.3. Comparison of FIB and IL-6 levels in all subjects of three groups

The FIB level in ovarian cancer group (3.81±1.41) g/L was significantly higher than that in benign ovarian tumor group and control group; IL-6 level (154.91±39.62) pg/mL was obviously higher than that in benign ovarian tumor group and control group,
Note: compared with benign ovarian tumor group, $P<0.05$; compared with control group, $P<0.05$.

### Table 4

Comparison of FIB and IL-6 levels of ovarian cancer patients in different stages.

<table>
<thead>
<tr>
<th>Different stages of ovarian cancer</th>
<th>$n$</th>
<th>FIB (g/L)</th>
<th>IL-6 (pg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>8</td>
<td>3.04±1.13</td>
<td>130.42±28.57</td>
</tr>
<tr>
<td>Stage II</td>
<td>11</td>
<td>4.21±1.22*</td>
<td>147.08±25.02*</td>
</tr>
<tr>
<td>Stage III &amp; Stage IV</td>
<td>21</td>
<td>4.75±1.51*</td>
<td>167.62±6.71*</td>
</tr>
</tbody>
</table>

Note: compared with stage I, $P<0.05$; compared with stage II, $P<0.05$.

and the difference was statistical significance ($P<0.05$). The levels of FIB and IL-6 in benign ovarian tumor group were not significantly different from those in control group, and the difference was not statistically significant ($P>0.05$), shown in Table 3.

### 3.4. Comparison of FIB and IL-6 levels of ovarian cancer patients in different stages

FIB, IL-6 levels in ovarian cancer patients enhanced gradually along with the clinical staging increasing. The FIB level in stage II of ovarian cancer (4.21 ± 1.22) g/L were significantly higher than that in stage I (3.04 ± 1.13) g/L, level in stage II and IV (4.75 ± 1.51) g/L was obviously higher than stage I, however it was not significantly different with stage II ($P>0.05$). The IL-6 level in stage II of ovarian cancer (147.08 ± 25.02) pg/mL was significantly higher than that in stage I (130.42 ± 28.57) pg/mL, level in stage II and IV (167.62 ± 6.71) pg/mL was significantly higher than stage I and stage II, the difference was statistically significant ($P<0.05$), shown in Table 4.

### 4. Discussion

Ovarian cancer is lack of early-specific clinical symptoms, and effective diagnosis is essential to improve the efficacy and prognosis[6]. In recent years, the detection of tumor markers has become an important tool for the early diagnosis of tumors. CA153, CA125 and CA72-4 are widely used in the auxiliary examination for diagnosis of ovarian cancer[7]. CA153 is more sensitive to the diagnosis and prognosis of breast cancer, and also has different degrees of elevation in tumors such as metastatic ovarian cancer, pancreatic cancer and lung cancer[8]. CA125 is a sensitive indicator of ovarian cancer diagnosis, has indicated effect on postoperative monitoring of the efficacy of ovarian cancer and whether the recurrence[9]. CA72-4 is a sensitive index of gastrointestinal cancer and ovarian cancer detection, especially with higher sensitivity for mucinous ovarian cancer, plays a good auxiliary role in the identification of ovarian disease[10]. However, the use of tumor markers alone for the early diagnosis of ovarian cancer has low specificity, and needs other indicators detection to be assisted[11]. The study found that[12] cytokines may play a role in the regulation of tumor cell growth and body anti-tumor immunity and the IL-6 level expression in malignant tumors is significantly higher than that of other gynecological diseases patients with normal ovary, which may affect tumor cell proliferation, have immunosuppressive effects on body, and induce liver to produce plasminogen activator inhibitors, resulting in the liver produce acute phase reaction protein FIB[13-16]. The occurrence and development of tumor is closely related with inflammatory reaction, and inflammatory environment affects the proliferation and migration of tumor cells. In this process, inflammation and stress response also can lead to FIB biosynthesis, therefore, the FIB level can also reflect that tumor progression at a certain extent[17-20].

The results of this study showed that the levels of CA153, CA125, CA72-4 and the levels of FIB and IL-6 in ovarian cancer group were significantly higher than those in benign ovarian tumor group and control group ($P<0.05$), while the difference between benign ovarian tumor group and control group was not significant ($P>0.05$). The results showed that the expression levels of serum CA153, CA125, CA72-4, FIB and IL-6 were abnormally elevated in ovarian cancer patients, while the concentration of serum CA153, CA125, CA72-4, FIB and IL-6 in patients with ovarian cancer and healthy women were not significantly different, suggesting that these tumor markers, FIB and IL-6 contributed to the clinical diagnosis of ovarian cancer detection. The reason might be that the secretion of tumor markers is closely related to tumor cell proliferation; the occurrence and development of malignant tumors can directly lead to increased levels of tumor markers, and the genesis and development process is closely related to inflammatory reactions, therefore also led to the FIB, IL-6 levels significantly increase in ovarian cancer group.

The results of this study demonstrated that with the clinical stage elevated, levels of CA153, CA125, CA72-4 in patients with ovarian...
cancer gradually increased, the clinical stage of patients was more advanced, and CA153, CA125, CA72-4 levels were higher, indicating that the above indicators detection was indicating effect on assessments of ovarian cancer; however, when ovarian cancer patients in stage I compared with stage II, only CA125 expression was significantly increased, which may be related to the specificity of the three indicators of ovarian cancer, showing the use of only tumor markers were with some limitations. Therefore, this paper examined the levels of FIB and IL-6 in different clinical stages of ovarian cancer patients: the levels of FIB and IL-6 in stage II and stage III and IV were significantly higher than those in stage I \( (P < 0.05) \). The IL-6 level in stage II and stage IV were significantly higher than those in stage I \( (P < 0.05) \). It revealed that the cancer staging of patients were more advanced, and the level of FIB and IL-6 were higher, indicating that the level of IL-6 is related to the staging and the condition of ovarian cancer. It may be because the high level expression of IL-6 will affect the inflammatory degree and immune level of ovarian cancer cells, and the degree of inflammatory reaction was higher, which more easily lead to the migration of tumor cells and a large number of FIB synthesis and accumulation. In conclusion, serum tumor markers CA153, CA125, CA72-4 and FIB, IL-6 levels in patients with ovarian cancer were significantly increased; clinical detection of these indicators contributed to the early diagnosis of ovarian cancer, so it is worthy of promotion.

References


