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Diagnosis of ovarian cancer and biomarkers

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Abstract

Ovarian cancer; worldwide, ranks seventh among the types of cancer seen in women. Since the disease does not show symptoms at an early stage, it is usually detected at stage III and stage IV. In other words, early diagnosis of ovarian cancer is quite difficult. Although certain methods are used to detect ovarian cancer, there is no exact method that can give results at an early stage yet. Biomarkers are an important criterion for studies in this sense. CA-125 (cancer antigen 125 or carcinoma antigen 125), VEGF (Vascular Endothelial Growth Factor), Osteopontin and Kallikrein proteins are some biomarkers that are looked at from the blood and can be used for the diagnosis of ovarian cancer. When the VEGF levels in the blood of patients diagnosed with ovarian cancer were examined, it was found that they were high and caused the accumulation of peritoneal fluid. It has been found that patients with serous epithelial adenocarcinoma ovarian cancer with low VEGF levels survive more than those with high VEGF levels. This has shown that VEGF is an important biomarker for early diagnosis of ovarian cancer, and studies can focus on it.

Introduction

Occurring in the epithelium or embryonic cells, which form the main structure of the ovaries in women a condition of uncontrolled cell growth and proliferation is called ovarian cancer. About 95% of ovarian cancers occur in epithelial cells. The remaining cases occur as a result of tumor formation in other ovarian tissues or cells of embryonic origin [1]. Ovarian cancer is the seventh most common type of cancer in women worldwide [2]. in 2018, 300,000 new cases of ovarian cancer were detected worldwide [3]. The incidence of the disease in developed countries is 9.4/100,000, mortality is 5.1/100,000, while the incidence in developing countries is 5/100,000 and mortality is 3.1/100,000.[1] Symptoms of ovarian cancer present themselves in the late stages of the disease

shows. A diagnosis of ovarian cancer is usually detected at the third or fourth stage of the disease. The survival rate of patients with stage I and stage II ovarian cancer is 90% and 70%, respectively. The survival rate of patients with stage III and stage IV ovarian cancer is less than 20% [4]. The main methods used in the diagnosis of ovarian cancer are blood tests, pelvic examination, ultrasonography and CA-125(cancer antigen 125 or carcinoma antigen 125) measurement. Diagnosis of early-stage ovarian cancer by pelvic examination is very rare due to the location of the ovaries in the pelvic area. With these methods used, it is very difficult to diagnose ovarian cancer at an early stage. For this reason, studies have been directed to look at biomarkers in blood tests [4]. Some of the biomarkers used in the diagnosis of ovarian cancer are CA-125, ostepontin, kallikrein and VEGF (Vascular Endothelial Growth Factor) [3].

Results

CA-125 is a protein encoded by the MUC16(Mucin 16) gene. Clinically, it is used as a diagnostic test to measure the amount of the protein CA-125 in serum. The normal value for CA-125 is 0-35 IU/ML. CA-125 levels in the serums of about 80% of women diagnosed with advanced ovarian cancer have shown high results [3]. In the cases studied, only 50% of patients in stage I and stage II had a high CA-125 value. Therefore, CA-125 is not sufficient for early detection of ovarian cancer [3]. In addition, in pregnancy, endometriosis and some inflammatory diseases, the serum CA-125 level is high. This is one of the other reasons that CA-125 should not be used as a biomarker alone [3]. It has been determined that the HE4(Human Epididymis Protein 4) biomarker increases the serum level of patients diagnosed with ovarian cancer. The HE4 level does not increase as much as the CA-125 level. It has been found that VEGF levels increase in patients with ovarian cancer and cause peritoneal fluid accumulation. Another study looked at the VEGF levels in the preoperative sera of 314 patients with ovarian cancer and found that high VEGF levels shorten the survival time [3].

Conclusion

As a result of these studies, we understand that there are methods that are not sufficient in the early diagnosis of ovarian cancer. For this reason, many research and experimental studies have been directed to biomarkers for early diagnosis of this type of cancer that gives late symptoms. The results also show that biomarkers can be an important indicator for early diagnosis.

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