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The Declaration of a Multi-Biomarker Panel as the Key to Ovarian Cancer Diagnosis

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Abstract

Early detection of ovarian cancer has been difficult in order to manage the high mortality rate caused by this deadly disease. The scientific contributions from around the world have helped to reduce mortality trends, but it remains the fifth leading cause of gynaecological mortality. The complexities in the clinical presentation, tumour origin, and gene expression profiles had added to the difficulty in understanding and diagnosing the disease. A stage 1 diagnosis of ovarian cancer increases the 5-year survival rate to around 92%. Cancer antigen-125 is the gold standard tumour marker found in abnormally high levels in the blood of many women with ovarian cancer. However, many non-cancerous conditions have high CA-125 levels, and several women have normal CA-125 levels in the early stages of ovarian cancer.

Keywords: Acute kidney injury • Biomarkers • Calprotectin • Kidney injury molecule

Introduction

Although ovarian cancer is uncommon, it is the fifth leading cause of cancer mortality among women worldwide.According to 2013-2015 data, approximately 1.3 percent of women are expected to be diagnosed with ovarian cancer during their lifetime. Furthermore, data from 2011 to 2015 show 11.6 per 100,000 annual cases of women and 7.2 per 100,000 deaths from ovarian cancer. This disease's poor prognosis is due to its advanced metastasis at the time of presentation and difficulty in diagnosing it in its early stages. More than 60% of cases are discovered after the cancer has spread [1].

Description

As a result, the strategy for managing this disease is to find a biomarker that can detect ovarian cancer at an early stage with high specificity and sensitivity. The challenges remained not only in the identification of such biomarkers, but also in the complexities of the disease itself in terms of epidemiology, histopathology, or genetic features that contribute to the disease's poor understanding. Ovarian cancer is regarded as a diverse disease with numerous types and subtypes. The extra-ovarian tissue origins of epithelial ovarian cancer contribute to the disease's complexities. Ovarian cancers are broadly classified into germ cells, sex cordstromal cells, and epithelial cells, with epithelial ovarian cancer accounting for more than 95% of the disease [2-4].

Nonetheless, no single biomarker has achieved the required specificity and sensitivity for the detection of early stage ovarian cancer.Several studies using multibiomarker approaches have been reported to improve sensitivity over single biomarker approaches while maintaining similar specificity in diagnosing early stage ovarian cancer. CA125 has been tested in conjunction with a number of other serum tumour biomarkers. CA-125 and HE4, for example, were shown to be the best among all two biomarker combinations in distinguishing benign cells from early stage ovarian cancer at 74.2% sensitivity and 85% specificity, whereas CA125, HE4, and EGFR distinguish benign from malignancy at 75.9% sensitivity and 87.5% specificity. In another case, a panel of six biomarkers (CA-125, osteopontin, leptin, prolactin, MIF, and IGF-II) was used [5].

Conclusion

Several studies in recent years have reported a diverse range of serological biomarkers in various combinations. However, in terms of specificity, sensitivity, and stability, reliable validated biomarker(s) are currently unavailable. As a result, optimal multiple biomarkers that improve early detection with high accuracy are urgently required.The following points are highlighted as key challenges for the development of ovarian cancer early detection biomarkers.

Acknowledgement

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Conflict of Interest

There are no conflicts of interest by author.

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