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$\Sigma=96$ tests



6502-16

MICROWELL ELISA

OVARIAN CANCER ANTIGEN (CA-125)

ENZYME IMMUNOASSAY TEST KIT

Enzyme Immunoassay for the Quantitative Measurement of Ovarian Cancer Antigen CA-125 in Human Serum

Intended use

The CA-125 EIA test is primarily intended for use as a monitoring and screening test. An abnormal result (i.e., elevated serum CA-125 level) can indicate ovarian cancer and suggests the need for further clinical management. The serum CA-125 test appears to be a useful tumor marker for patients in clinical remission, following treatment. Post-operative serum CA-125 values that fail to return to normal, strongly suggest the presence of residual tumor. Tumor recurrence is often accompanied by a rise of serum CA-125 before progressive disease is clinically evident.

Introduction

One in every 70 American women will develop ovarian cancer in her life. There are approximately 20,000 new cases of ovarian cancer diagnosed every year and more than 12,000 women die each year because of it. Ovarian cancer is the most malignant type of gynecological cancers, with an overall 5-year survival rate of only 30%. This is because diagnosis is often not made until the advanced stage. Cancer Antigen 125 (CA-125) is a surface antigen associated with epithelial ovarian cancer. In serum, CA-125 is associated with a high molecular weight glycoprotein. Serum concentrations of this tumor marker can be detected and measured by a murine monoclonal antibody. Published studies have indicated that elevated serum CA-125 levels can be found in individuals with serious endometroid, clear-cell and undifferentiated ovarian carcinoma. Serum CA-125 levels higher than normal can also be found in individuals with adenocarcinoma of the fallopian tube endometrium, certain non-gynecologic malignancies and some non-malignant conditions.

The serum CA-125 concentration is greater than 35 units per ml in about 60% of women with ovarian cancer. More than 80% of patients with disseminated ovarian cancer, have serum CA-125 concentrations greater than 35 units per ml. The serum CA-125 is elevated in 1% of normal healthy women, 3% of normal healthy women with benign ovarian diseases, 6% of patients with non-neoplastic conditions (including but not limited to first trimester pregnancy, menstruation, endometriosis, uterine fibrosis, acute salphingitis, hepatic diseases and inflammation of peritoneum, pericardium or pleura). Serum levels of CA-125 greater than 35 units per ml. combined with pelvic examination increases the test

specificity. Serial determinations of serum CA-125 further enhances the positive predictive value of the test for ovarian cancer. Serum CA-125 concentration may be useful in monitoring patients with diagnosed ovarian cancer. A persistently high serum CA-125 may be associated with progressive malignant disease and poor therapeutic response. On the other hand, a declining CA-125 value appears to be indicative of a favorable prognosis and a good response to treatment. Residual disease is confirmed in 95% of patients with serum CA-125 concentrations greater than 35 units per ml., however, negative results do not necessarily exclude the disease. To date, CA-125 is the most sensitive marker for residual epithelial ovarian cancer. CA-125 may also be elevated in patients with lung, cervical, fallopian tube, and uterine cancer and endometriosis.

Test principle

The CA-125 Quantitative Test Kit is based on a solid phase enzyme-linked immunosorbent assay. The assay system utilizes one monoclonal anti-CA-125 antibody for solid phase (microtiter wells) immobilization and another monoclonal anti-CA 125 antibody in the antibody-enzyme (horseradish peroxidase) conjugate solution. The standards and test specimen (serum) are added to the CA-125 antibody coated microtiter wells. Then CA-125 antibody labeled with horseradish peroxidase (conjugate) is added. If human CA-125 is present in the specimen, it will combine with the antibody on the well and the enzyme conjugate resulting in the CA-125 molecules being sandwiched between the solid phase and enzyme-linked antibodies. After a 3 hour incubation at 37°C , the wells are washed with water to remove unbound labeled antibodies. A solution of TMB is added and incubated for 20 minutes, resulting in the development of a blue color. The color development is stopped with the addition of 2N HCl. The color is changed to yellow and measured spectrophotometrically at 450 nm. The concentration of CA-125 is directly proportional to the color intensity of the test sample.

Materials and components

Materials provided with the test kits:

- Monoclonal anti-CA-125 antibody coated microtiter plate with 96 wells.
- Enzyme conjugate reagent, 12 ml.
- CA-125 reference standards containing; 0,15,50, 100, 200, and 400 Unit/ml of CA-125, Liquid, ready to use 1 set.
- TMB Substrate, 12 ml
- Sotp Solution, 12ml.

Materials required but not provided:

- Precision pipettes and tips, 0.04-0.2ml
- Disposable pipette tips.
- Distilled water.
- Vortex mixer.
- Absorbent paper or paper towel.
- Microtiter plate reader.
- Graph paper.

Specimen collection and preparation

1. Blood should be drawn using standard venipuncture techniques and the serum should be separated from the red blood cells as soon as practical. Avoid grossly hemolytic, lipemic or turbid samples.
2. Plasma samples collected in tubes containing EDTA, heparin, or oxalate may interfere with test procedures and should be avoided.

- Specimens should be capped and may be stored up to 48 hours at 2-8 °C, prior to assaying. Specimens held for a longer time can be frozen at -20°C. Thawed samples must be mixed prior to testing.

Storage of test kits and instrumentation

- Unopened test kits should be stored at 2-8°C upon receipt and the microtiter plate should be kept in a sealed bag with desiccants to minimize exposure to damp air. The test kit may be used throughout the expiration date of the kit (One year from the date of manufacture). Refer to the package label for the expiration date.
- Opened test kits will remain stable until the expiring date shown, provided it is stored as prescribed above.
- A microtiter plate reader with a bandwidth of 10nm or less and an optical density range of 0-2 OD or greater at 450nm wavelength is acceptable for use in absorbance measurement.

Reagent preparation

All reagents should be brought to room temperature (18-22°C) and mixed by gently inverting or swirling prior to use. Do NOT induce foaming.

Assay procedure

- Secure the desired number of coated wells in the holder. Dispense 100µl of CA-125 standards, specimens, and controls into the appropriate wells. Gently but thoroughly mix for 10 seconds.
- Dispense 100µl of enzyme conjugate reagent into each well. Mix gently for 30 seconds. It is very important to have complete mixing in this setup. Incubate at 37°C for 3 hours.
- Remove the incubation mixture by emptying the plate content into a waste container. Rinse and empty the microtiter plate 5 times with distilled water. Strike the microtiter plate sharply onto absorbent paper or paper towels to remove all residual water droplets.
- Dispense 100µl of TMB substrate reagent into each well. Gently mix for 10 seconds. Incubate at room temperature, in the dark, for 20 minutes.
- Stop the reaction by adding 100µl of Stop Solution to each well. Gently mix for 10 seconds until the blue color completely changes to yellow.
- Read the optical density at 450nm with a microtiter plate reader within 15 minutes.

Important Note:

- The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.
- It is recommended that no more than 32 wells be used for each assay run if manual pipetting is used since pipetting of all standards, specimens and controls should be completed within 5 minutes. A full plate of 96 wells may be used if automated pipetting is available.
- Duplication of all standards and specimens, although not required, is recommended.

Calculation of results

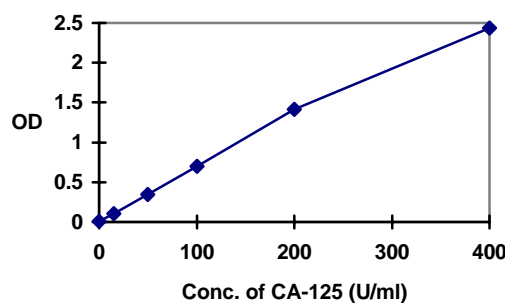
Calculate the mean absorbance value for each set of CA-125 reference standards, specimens and controls. Construct a standard curve by plotting the mean absorbance obtained from each reference standard against its concentration in units per ml on linear graph paper, with absorbance values on the vertical or Y axis and concentrations on the horizontal or X axis. Use the mean absorbance values for each specimen to determine the corresponding concentration of CA-125 in units per ml from the standard curve. Any diluted specimens must be corrected by the appropriate dilution factor.

Example of standard curve

Results of a typical standard run with optical density reading at 450nm shown in the Y axis against CA-125 concentrations shown in the X axis.

CA-125 Values (U/ml)	Absorbance (450nm)
0	0.010
15	0.105
50	0.347
100	0.703
200	1.411
400	2.437

This standard curve is for the purpose of illustration only, and should not be used to calculate unknowns. Each user should obtain his or her own standard curve and data.



Expected values and sensitivity

Healthy women are expected to have CA-125 assay values below 35 U/ml. The minimum detectable concentration of CA-125 in this assay is estimated to be 5 U/ml.

Limitations of the Procedure

- Reliable and reproducible results will be obtained when the assay procedure is carried out with a complete understanding of the package insert instructions and with adherence to good laboratory practice.
- The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.
- Heterophilic antibodies such as human anti-mouse antibodies (HAMA) are frequently found in the serum of human subjects. Those antibodies can cause severe interference in many immunodiagnostic procedures. This assay has been designed to minimize that kinds of interference. Nevertheless, complete elimination of this interference from all patient specimens cannot be guaranteed. A test result that is inconsistent with the clinical picture and patient history should be interpreted with caution.

References

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ISO 13485-2003

Revision Date: 4/6/06