CEA

Pseudonyms – Carcinoembryonic Antigen

CEA is a small glycoprotein which may have a role in cell adhesion and apoptosis. Its main clinical use is in post-diagnosis surveillance of colorectal carcinoma, for monitoring for recurrence. Levels are high in the neonatal period and fall rapidly to very low levels after birth.

General information

Collection container:

Adults – serum (with gel separator, 4.9mL brown top Sarstedt tube)

Paediatrics – lithium heparin plasma (1.2mL orange top Sarstedt tube)

Type and volume of sample:

The tubes should be thoroughly mixed before transport to the lab. 1mL whole blood is required as a minimum volume if only CEA is requested.

CEA can also be measured in other fluids e.g. cyst, ascitic, **not** urine, and should be collected into a sterile pot with NO preservative.

Specimen transport/special precautions:

Samples should not be taken from patients receiving therapy with high biotin doses (i.e. > 5 mg/day) until at least 8 hours following the last biotin administration.

Laboratory information

Method principle:

A two-site electrochemiluminescence immunoassay is used on the automated equipment.

This method has been standardized against the 1st IRP WHO Reference Standard 73/601

Biological reference range or cut off:

<5.0ug/L Non smoker

Smoker – levels may be up to 6.5ug/L

No values are available for other fluids, the result should be interpreted in light of the blood levels in a sample taken at the same time.

Turnaround times:

Same day (analysed at Trafford and Wythenshawe laboratories).

Clinical information

Factors known to significantly affect the results:

5-fluoro-uracil treatment can elevate levels.

Clinical decision points:

CEA is elevated in up to 60% of patients with colorectal cancer, more commonly in advanced disease but it is neither sufficiently sensitive nor specific to be used as a diagnostic marker. Other malignancies with elevated CEA levels include pancreatic, lung, prostate and medullary thyroid cancer. Benign disease with elevated CEA include various liver diseases, pancreatitis, inflammatory bowel disease and renal impairment.

Pre-operative levels can predict the risk of recurrence but serum levels correlate poorly with tumour bulk. Post-treatment, a repeat sample should be taken after 4-6 weeks. Lead time (before clinical detection of recurrence) is 4 to 6 months with a significant increase considered equal to 25-35%.

Monitoring should occur every 3 months for the first 3 years following treatment.

Reference:

Tumor markers in colorectal cancer, gastric cancer and gastrointestinal stromal cancers: European group on tumor markers 2014 guidelines update. MJ Duffy,et al.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4217376/

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