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ST VINCENT'S PATHOLOGY

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CA 15-3 INFORMATION SHEET

GENERAL

CA 15-3 is a mucinous antigen defined by 2 monoclonal antibodies. These have been raised against human milk fat globule membranes (115 D8) and metastatic breast cancer cells (DF3) respectively. The antigen is an epitope of Polymorphic Epithelial Mucin (PEM), a high molecular weight (300-400,00), heavily glycosylated protein encoded by the MUC1 gene. Depending on the tissue the level of glycosylation, and therefore the molecular weight, can vary considerably. While CA 15-3 is a normal product of breast cells, in cancer it is frequently over-expressed and spread more widely on the cell membrane rather than restricted to the apical surface. Additionally altered glycosylation may expose additional epitopes for recognition.

PATHOLOGY

CA 15-3 is recommended for the monitoring of the course and response to therapy of breast cancer. It is elevated in up to 70% of patients with metastatic disease however, as it is only elevated in 3% of those with localised cancer there is no role for screening with this marker. CA 15-3 shows a high specificity for malignancy in breast disease, rarely being elevated in benign breast conditions, and then usually less at levels than 50 kU/L. Note than a normal result for CA 15-3 does not exclude malignancy with over 40% of patients with advanced disease having results within the reference interval. The elevation of CA 15-3 in breast cancer is related to the tumour bulk and accessibility to the vascular system and levels over 120 kU/L are found in over 30% of patients with stage IV disease.

The best use of this marker for breast cancer patients remains controversial. It is not recommended for monitoring unless the marker was high at the time of initial treatment. As with all tumour markers it uses in monitoring disease is only justified if there is a treatment option which may be used in response to disease progression, thus recommendations will change as treatment options develop. Elevated levels are also found in other cancers, particularly lung, gastrointestinal, prostate, pancreas, cervical and ovarian, however elevated levels are generally associated with advanced disease. Mild elevations have been reported in patients with hepatitis, cirrhosis, autoimmune disorders as well as benign disorders of the lung and breast. Additionally, a slight rise may be seen in the third trimester of pregnancy.

REFERENCE INTERVAL

< 30 U/ml
(approximately 95% of well women will have CA 15-3 values less than this level)

REFERENCE

Duffy MJ. CA 15-3 and related mucins as circulating markers in breast cancer. Ann Clin Biochem. 1999;36:579-86.

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