



Article:

U-H. Stenman.

Validating serum markers for monitoring of cancer.

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Guest:

Dr. Ulf-Hakan Stenman is a former Chair of Clinical Chemistry at Helsinki University and an active cancer researcher.

Bob Barrett:

This is the podcast from *Clinical Chemistry*. I am Bob Barrett.

One of the major clinical applications for measuring tumor markers is in the monitoring of cancer patients over time. However, there are few published guidelines on just how to evaluate biomarkers for this purpose.

To address this, guidelines from the European Group on Tumor Markers appeared in the January 2013 issue of *Clinical Chemistry*. Accompanying this report is an editorial on validating serum markers for monitoring of cancer.

The author of that editorial Ulf-Hakan Stenman is our guest in today's podcast. Dr. Stenman is a former Chair of Clinical Chemistry at Helsinki University and an active cancer researcher.

Doctor, why are the tumor marker guidelines published in *Clinical Chemistry* by the European Group so important?

Dr. Ulf-Hakan Stenman:

This article emphasizes the need to validate the clinical use of tumor marker for monitoring cancer patients after primary therapy. Some widely used methods are not based on evidence and it's important to show whether the patient benefits from this practice.

Many patients appreciate the sense of security associated in monitoring even if this does not improve the outcome. But frequent monitoring is on the other hand expensive and ineffective procedures should be abandoned.

Bob Barrett: Now these guidelines can be awfully complicated. Can they be implemented easily?

Dr. Ulf-Hakan Stenman: The guidelines are very comprehensive and evaluation of a marker according to this will be very expensive. However, if the evaluation leads to a change in the use of a marker the cost may be justified.

Bob Barrett: Developments in cancer biology are always moving rapidly. Can this be expected to lead to the development of new tumor markers?

Dr. Ulf-Hakan Stenman: It's actually surprising that the huge amount of new information on the biology of cancer has not led to defining of new serum markers. The numerous changes in gene expression observed in cancer are fairly seldom reflected in corresponding changes in protein production.

A promising new approach may be the analysis of circulating tumor cells. Thanks to rapid development of DNA sequencing, it is becoming possible to analyze gene expression in single cells.

Isolation of tumor cells from blood may facilitate characterization or changes into gene expression occurring when a tumor becomes resistant to the initially used therapy.

These changes can hopefully be used to direct therapy. It remains to be shown whether this approach is successful. Isolation and characterization of tumor cells is in any case much more expensive than determination of a tumor marker by immunological methods.

However, this approach may be economically feasible if it facilitates selection of optimum curative therapy. I do not expect that these new techniques will make tumor markers obsolete, but if successful they will affect the way we diagnose and monitor cancer.

Bob Barrett: Should all new tumor markers be evaluated before being introduced into clinical practice?

Dr. Ulf-Hakan Stenman: It is desirable that new markers are evaluated before being applied to monitoring of cancer patients.

However, if this has to be done before the marker is marketed, it'll probably delay the introduction of new markers.

Presently, the introduction of a new marker is preceded by careful evaluation of the economic prospects by the IVD company marketing the test. While monitoring is the most common use of tumor markers, they may also be quite useful if they provide diagnostic and prognostic information. Thus, demonstration of the validity for monitoring is not needed before introduction.

Bob Barrett: Doctor, in addition to the new markers is it desirable to also evaluate the established markers according to the guidelines?

Dr. Ulf-Hakan Stenman: Yes, very few markers have been evaluated according to the guidelines and it is important that the use of present markers is based on evidence. In many cases the use of a marker for monitoring is evident without formal validation according to the guidelines. For example, the use of BSA for monitoring of patients with prostate cancer and hCG for monitoring of trophoblastic disease. In other cases validation needs to be performed.

Bob Barrett: Well finally, doctor, will introduction of new therapies require reevaluation of the existing markers?

Dr. Ulf-Hakan Stenman: Introduction of new therapies targeting specific disease mechanism may require reevaluation of the use of markers and possibly use of new markers that preferably would reflect the disease mechanism. However, there are so far no such markers that we can determine in serum.

Bob Barrett: Dr. Ulf-Hakan Stenman is a former Chair of Clinical Chemistry at Helsinki University and an active cancer researcher. He's been our guest in this podcast from *Clinical Chemistry*.

I'm Bob Barrett. Thanks for listening.