K-ASSAY®

Prealbumin

For the Quantitative Determination of Human Prealbumin in Serum

Cat. No. KAI-053

INTENDED USE

For the quantitative determination of human prealbumin in serum by immunoturbidimetric assay. FOR IN VITRO DIAGNOSTIC USE.

INTRODUCTION AND SUMMARY

Prealbumin (thyroxin-binding prealbumin) transports thyroid hormones thyroxin (T₄) and triiodothyronine (T₃). It also transports vitamin A in association with retinol binding globulin.

Prealbumin levels are useful in the evaluation of several clinical conditions. Levels are decreased in most forms of acute and chronic hepatic disease. Prealbumin is a negative acute phase reactant with decreased levels associated with diseases involving inflammation or tissue necrosis.

Prealbumin has a circulation life of less than 2 days and is therefore a sensitive indicator of protein-calorie malnutrition.

Prealbumin has been measured using a variety of methods, including radioimmunoassay (RIA), radial diffusion, nephelometric, and enzyme-linked immunosorbent assay. The K-ASSAY® Prealbumin assay uses an immunoturbidimetric format.

PRINCIPLE OF TEST

The K-ASSAY® Prealbumin assay quantifies prealbumin based on immunoturbidimetric assay. The reagent uses a goat polyclonal antibody specific for human prealbumin.

The antibody binds to the prealbumin in the serum forming light scattering immune complexes which increase the turbidity of the sample. Since the increase in turbidity is proportional to the amount of prealbumin in the sample, the prealbumin concentration can be determined by measuring this increase in turbidity. The increase in turbidity is measured at 340 nm.

REAGENT STABILITY

All reagents should be stored refrigerated (2-8°C). Return all reagents to 2-8°C promptly after use. Unopened reagents can be used for one year from date of manufacture, as indicated by the expiration date on package and bottle labels. Opened reagents can be used for one month if stored at 2-8°C.

REAGENT STABILITY

Discard reagents if they become contaminated. Evidence of cloudiness or particulate material in solution is cause to discard. If the absorbance of the isotonic saline is greater than 0.05 or if the absorbance of the calibrator with 13 mg/dL of prealbumin is greater than 0.05, reagents should not be used.

STORAGE AND HANDLING

All reagents should be stored refrigerated (2-8°C). Return all reagents to 2-8°C promptly after use. Unopened reagents can be used for one year from date of manufacture, as indicated by the expiration date on package and bottle labels. Opened reagents can be used for one month if stored at 2-8°C.

QUALITY CONTROL

Normal and abnormal controls of known concentration should be included in each assay performed. These controls should fall within the stated values assigned to the controls. The validity of the assay is in question if the value for the controls generated by the assay's calibration curve does not fall within the stated range. Recalibrate if the value determined for the controls falls outside the stated recovery range.

CALIBRATION

It is recommended that prealbumin levels be determined using a multi-point calibration curve prepared using the K-ASSAY® Prealbumin Calibrator. It is recommended that the user determine calibration curve frequency as this depends on the instrument and type/number of other assays being performed.

Use plastic tubs for storing the sample, do not use glass. Avoid multiple freeze-thaws.

ASSAY PROCEDURE

Measurement of absorbance is to be made with an instrument able to accurately read absorbance at 340 and 700 nm. Refer to the instrument manual from the manufacturer regarding the following:

- Use or function
- Installation procedures and requirements
- Principles of operation
- Performance characteristics, operating instructions
- Calibration procedures including materials and / or equipment to be used
- Operational precautions, limitations, and hazards
- Service and maintenance information

SPECIMEN COLLECTION AND PREPARATION

It is recommended that specimen collection be carried out in accordance with NCCLS document M29-T2. No method can offer complete assurance that human blood samples will not transmit infection. Therefore, all blood samples should be considered potentially infectious.

Serum is required for this assay. Do not use plasma or patient samples contaminated with heparin. Blood should be collected and the serum collected as soon as possible. Soon after the blood is drawn, it should be allowed to clot, centrifuged, and the serum separated from the clot to a plastic tube (not glass). Samples not tested within 72 hours should be frozen at -20°C. Avoid multiple freeze-thaws.

SAMPLE VOLUME

(5) µL

R1 VOLUME

(250) µL (NO)

R2 VOLUME

(50) µL (NO)

PROCEDURE

MATERIALS SUPPLIED

Reagent 1 (R-1) Buffer Reagent

Reagent 2 (R-2) Antiserum Reagent

Use plastic tubes for storing the sample, do not use glass.

SAFETY

For the Quantitative Determination of Human Prealbumin in Serum

It is recommended that prealbumin levels be determined using a multi-point calibration curve prepared using the K-ASSAY® Prealbumin Calibrator. It is recommended that the user determine calibration curve frequency as this depends on the instrument and type/number of other assays being performed. Initially, calibration should be performed each day.

QUALITY CONTROL

Normal and abnormal controls of known concentration should be included in each assay performed. These controls should fall within the stated values assigned to the controls. The validity of the assay is in question if the value for the controls generated by the assay's calibration curve does not fall within the stated range. Recalibrate if the value determined for the controls falls outside the stated recovery range.
LIMITATIONS OF PROCEDURE

The measurable range for prealbumin is between 0 to 60 mg/dL. Grossly lipemic samples and samples with very high triglyceride concentrations should be diluted 1 part sample with 1 part isotonic saline or filtered to decrease nonspecific light scattering. Multiply results by 2 to compensate for the dilution.

If the prealbumin concentration of a patient sample is greater than the highest calibrator value, dilute 1 part sample with 4 parts isotonic saline and reassay. Multiply results by 5 to compensate for the dilution.

This assay should not be used with plasma samples or with patient samples contaminated with heparin.

PERFORMANCE

Precision

The precision for the K-ASSAY® Prealbumin assay was determined using packaged reagents, pooled human serum, and a Hitachi 717 analyzer.

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>CV</th>
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</thead>
</table>
| I      | 20 | 11.2  | 0.145| 1.29%
| II     | 20 | 24.9  | 0.289| 1.16%
| III    | 20 | 57.0  | 0.767| 1.35%

Accuracy / Correlation

A comparison of the K-ASSAY® Prealbumin assay and a similar Prealbumin assay was performed using a Hitachi 717. The test results provided the following data:

\[ y = 0.9164x - 0.332 \]

\[ r = 0.9924 \]

\[ n = 50 \]

\[ x_{\text{min}} = 5.7 \quad y_{\text{min}} = 4.2 \]

\[ \text{max} = 43.2 \quad \text{max} = 38.4 \]

\[ \text{mean} = 22.89 \quad \text{mean} = 20.64 \]

Linearity

Linearity tests were performed with dilutions of normal human serum spiked with prealbumin. Testing was linear from 0 to 60 mg/dL of prealbumin.

INTERFERENCE

Bilirubin F and C: No interference up to 20 mg/dL
Hemoglobin: No interference up to 470 mg/dL
Lipemia: No interference up to 5%.

EXPECTED VALUES

The expected value as reported in the scientific literature is between 16 to 40 mg/dL. Each laboratory should establish its own expected values using this kit.

REFERENCES