Sialylated carbohydrate antigen KL-6 kit

Nanopia™ KL-6

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1. Purpose of use

For measuring KL-6 in serum or plasma
KL-6 is a sialylated carbohydrate antigen that was detected by Kohno et al. in 1985. It is a high molecular weight glycoprotein that is expressed by type II alveolar epithelial cells and is a mucin which belongs to MUC-1 in cluster 9. It has been confirmed that the serum KL-6 level is significantly higher in patients with interstitial pneumonia than in healthy volunteers or patients with other respiratory diseases, and it has been shown by ROC analysis that serum KL-6 is a useful diagnostic indicator. In addition, serum KL-6 is considered to be useful for assessing disease activity, because serum KL-6 levels are significantly higher in patients with active interstitial pneumonia than in patients with inactive pneumonia. Furthermore, it has been noted that the parameter will change depending on the pathology of interstitial pneumonia during follow-up.

2. Features

1. Suitable for use on most analyzers
2. Ready-to-use reagent.
3. No need to pretreat sample.
4. Results available in 10 minutes

3. Components and Ingredients

- KL-6 buffer reagent 1
- KL-6 latex reagent 2
  Anti-humanKL-6 mouse monoclonal antibody coated latex

4. Measurement principle (Latex-enhanced immunoturbidimetric assay)

Sialylated carbohydrate antigen KL-6(KL-6) in samples agglutinates with mouse KL-6 monoclonal antibody coated latex through an antigen-antibody reaction. The change in absorbance caused by this agglutination is measured to determine the KL-6 level.

5. Data

<table>
<thead>
<tr>
<th>Within-run reproducibility</th>
<th>(U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample1</td>
<td>Sample2</td>
</tr>
<tr>
<td>Mean</td>
<td>427.0</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.68</td>
</tr>
<tr>
<td>C.V. (%)</td>
<td>1.33</td>
</tr>
<tr>
<td>Min.</td>
<td>416</td>
</tr>
<tr>
<td>Range</td>
<td>24</td>
</tr>
</tbody>
</table>

6. Linearity

- Correlation with ECLIA
- Correlation with ELISA

7. Interference

- F-BIL
- C-BIL
- Hb
- Chyle
- Ascorbic acid
- Rheumatoid factor

<table>
<thead>
<tr>
<th>Interference</th>
<th>(U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-BIL</td>
<td>20 mg/dL</td>
</tr>
<tr>
<td>C-BIL</td>
<td>20 mg/dL</td>
</tr>
<tr>
<td>Hb</td>
<td>50 mg/dL</td>
</tr>
<tr>
<td>Chyle</td>
<td>50 mg/dL</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>50 mg/dL</td>
</tr>
<tr>
<td>Rheumatoid factor</td>
<td>500 U/mL</td>
</tr>
</tbody>
</table>

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1) Kohno N, Med J, Hiroshima Univ, 33, 971:1985
2) Kohno N. Respiration, 16,391:1997
1. History of Development

- 1985 Kohno et al. produced an anti KL-6 monoclonal antibody. 1)
- 1989 KL-6 was reported to be a useful marker for disease activity by providing high positive rates for interstitial pneumonia. 2)
- 1993 KL-6 was classified as an antibody that recognizes MUC1 in the 3rd international workshop on lung cancer and lung cell cluster classification. 3)
- 1996 14 Japanese medical institutions re-confirmed the 1989 publication regarding the usefulness of KL-6 in Interstitial Lung Diseases. 4)
- 1999 Eitest KL-6(ELISA) was launched in Japan.
- 2009 Nanopia KL-6 was launched in Japan.

2. Alveolar pneumonia and Interstitial Pneumonia (IP)

“Pneumonia” is a general term that refers to inflammation that occurs in the structures responsible for gas exchange at the bronchiole level and smaller.

- **Pneumonia [Alveolar Pneumonia]**
  - Inflammation occurs primarily inside the alveolar cavity.
  - Alveolar structure is largely unaffected.

- **Pneumonitis [Interstitial Pneumonia]**
  - Inflammation occurs primarily in the alveolar wall (including epithelium).
  - The alveoli thicken, due to fibrosis of alveolar fluid.

3. Specificity of KL-6 in IP patients

KL-6 is specific to patients with interstitial pneumonia.

4. Treatment of IP at various stages

- **IP is divided into a number of stage of fibrosis.**
  1) Irritation caused by some reason
  2) Continuous inflammation
  3) Fibrosis

- Steroids or immune suppressants are used for treatment.
5. Comparison of KL-6 with other markers

Comparison of KL-6 and LDH, erythrocyte sedimentation rate (ESR) and CRP on a ROC curve. KL-6 is the most useful compared to the other markers.

6. Changes of Disease Conditions and KL-6 level

Changes of Disease Conditions and KL-6 level

Cases Improved (N=10) Unchange (N=6) Exacerbate (N=6)

KL-6 levels before and after treatment for improved, unchanged, and exacerbated cases. KL-6, SP-D, and LDH levels are compared.

7. Drug-induced Interstitial Pneumonia

Japanese are more likely to develop IP than Europeans.
- Gefitinib (Iressa) 5.8% (20times)
- Leflunomide (Arava) 1.8% (80times)
- Bleomycin (Bleo) 10.2% (60times)
- Irinotecan (Campto) 1.3%
- Interferon 0.1%
- Etanercept 0.6%

Based on IFU of each drug.

Tacrolimus induces Interstitial Pneumonia as a side effect in rheumatoid patients. There are no side effects when used as an immunosuppressor for transplant recipients even if the blood concentration level is 3-fold.

8. Diagnosis flow chart for Drug-induced Interstitial Pneumonia

Chest X-ray
KL-6, SP-D

Diagnosis flow chart for Drug-induced Interstitial Pneumonia.

BP – D Discan
Cytomegalovirus
Coughed-up sputum
Bacteria culture DNA test
Acid fast bacillus culture - DNA test
Pneumocystis DNA test

Cough (dry)
Dyspnea (Breathing trouble)

Differential diagnosis

KL-6 is the most useful compared to the other markers.