Carbohydrate deficient transferrin (CDT) is the acronym for two of the glycoforms of Tf with the lowest degree of glycosylation: asialo-Tf and disialo-Tf.

Asialo-Tf is the form of CDT lacking any oligosaccharide chain (Fig. 1).

CDT is a highly specific biomarker of chronic alcohol abuse but asialo-Tf is excluded from CDT computation due to its low concentration in serum [1].

However, asialo-Tf could provide precious additional information to confirm an elevated CDT result, merely based on disialo-Tf analysis.

Aims of the work:
1. comparison between CE and HPLC in their ability to detect and measure asialo-Tf in human serum;
2. re-evaluation of the potential of asialo-Tf as additional, potentially more specific, biomarker of chronic alcohol abuse.

Methods

Sample preparation

- CE: serum samples saturated with a commercial ready-to-use ferric solution.
- HPLC: serum samples treated for lipoprotein precipitation with CaCl₂ and saturated with a commercial ready-to-use ferric solution.

CE vs. HPLC analytical conditions

<table>
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<th>CE</th>
<th>HPLC</th>
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|Running buffer: 120 mM H₂BO₃, pH 8.2 + 6 mM DAB (1,4-diaminobutane)|\[\text{Chromatography by salt gradient elution}\]
|Hydrodynamic injection: 0.5 psi x 25 s|Column: anion-exchange column [65 x 6 mm (i.d.)]|
|Separation voltage: 30 kV|Sample injection: 100 µL|
|Capillary: 30 µm I.D. x 60 cm T.L.|Flow rate: 1 ml/min|
|Detection: UV absorbance at 206 nm|Detection: absorbance at 460 nm|
|Cut-off: 1.8 %|Cut-off: 1.9 %|

Data were also verified using the commercial assay Minicap CDT (Sebia, Lisses)

Results and Discussion

- 221 serum samples were analysed
  - 73 CDT positive in CE, 40 asialo-Tf
  - 71 CDT positive in HPLC, 2 asialo-Tf
  - 148 CDT negative in CE, 0 asialo-Tf
  - 150 CDT negative in HPLC, 0 asialo-Tf

Conclusions

- Asialo-Tf could confirm the diagnostic value of elevated CDT results.
- Re-evaluation of asialo-Tf as additional, possibly more specific, biomarker of alcohol abuse.
- CE provides information on asialo-Tf in most of the “CDT positive” samples, whereas HPLC is inadequate for this purpose.
- Future directions:
  - improving the selectivity of CE for asialo-Tf;
  - increasing the knowledge of clinical meaning of an “elevated CDT”.

References


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