

## Predictive value of CDT (carbohydrate-deficient transferrin) in assessing fitness to drive

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RAFFAELE GIORGETTI, LORENZO LUPORINI, STEFANIA PAGANI, ADRIANO TAGLIABRACCI

Dipartimento di Neuroscienze, Sezione di Medicina Legale, Università Politecnica delle Marche, Ancona, Italy

In Italy, the Highway Code states that persons fined for driving under the influence of alcohol (DUI) have their driving licences suspended and are subjected to medical examination in order to verify their addiction to alcohol or its misuse before their licences can be regranted.

In spite of the existence of a single nation-wide regulation, the ways in which abuse/misuse are diagnosed are not uniform and standardised throughout Italy. The specialised international literature reports that carbohydrate-deficient transferrin (CDT) rates have high sensitivity and even higher specificity: however, this may lead those responsible for ascertainment to come to a judgement based on the result of this test alone.

Instead, the Institute of Forensic Medicine of Ancona has prepared an ascertainment procedure which is based on the following integrated elements:

- traditional parameters of chronic alcohol abuse (e.g. MCV, AST, ALT, gamma-GT, alkaline phosphatase, bilirubin);
- identification of ethyl alcohol in urine;
- toxicological and forensic examination by a specialist, including family history, and information on the subject's physiological, pathological, occupational and traumatic histories, an objective physical examination aimed at finding intoxication/withdrawal symptoms, and clinical data indicating alcohol abuse (hepatomegaly, spider naevi, signs of portal hypertension, ascites, gynecomastia), together with neurological and general internal medicine tests;
- diagnostic procedure based on DSM-IV criteria;
- CDT rate.

**AIM:** The aim of this study was to verify the existence of a correlation between CDT rate, markers of liver damage and clinical signs in the population of DUI drivers, and to ascertain the predictive value of the CDT marker alone.

**METHODS:** A population of 1605 men and women, aged between 18 and 70, whose driving licences had been suspended for DUI, were examined at the Institute of Forensic Medicine of the Regional Hospital of Ancona in the period April 2005-April 2006. Twenty-six clinical and laboratory parameters were examined, the main correlation of which regarded CDT rates. CDT was measured by capillary electrophoresis on P/ACE MDQ equipment (Beckman Coulter®, Fullerton, CA, USA) according to the indications and material supplied by the manufacturer. Statistical analysis was carried out by the chi-square test and logistic multiple regression.

**RESULTS:** a good correlation was found between CDT rates and markers of liver damage (MCV, gamma-GT) and deambulation, but border-line correlation was found between CDT rates and other clinical signs such as tremors.

**CONCLUSIONS:** even if the predictive positivity value of CDT is significant, it should be considered of relatively limited value as a single marker of alcohol abuse, in forensic toxicology field. Assessment of driving capacity based only on CDT rates may, on one hand, involve regranting of licences to persons who have an at-risk history of abuse/misuse of or addiction to alcohol. On the other hand, it may, and mainly, penalise persons in whom all other diagnostic elements are negative and for whom no existence of abuse/misuse of alcohol can be confirmed.

**KEYWORDS:** *Carbohydrate Deficient Transferrin, Licence regranting, Ethyl Alcohol*

**Corresponding author:** [r.giorgetti@univpm.it](mailto:r.giorgetti@univpm.it)