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Carbohydrate De f cient Transferrin: How reliable is it as a Biomarker for Chronic Alcohol Consumption?

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ABSTRACT: *Alcohol use disorders are a major cause of a number of health, economic and social challenges for individuals, their families and health care systems worldwide. The inadequate and inaccurate assessment of long-term drinking demeanors is a signiýcant and substantial hindrance to its diagnosis and management. Biomarkers for chronic alcohol consumption are now well established as reliable diagnostic aids but their sensitivity and speciýcity still need to improve. Therefore, there is a deýnitive need for the development of more sensitive and speciýc markers of alcohol abuse and addiction. Biological markers of alcoholism are divided into two cohorts: conventional and circumstantial indices. Lineal markers are detected in some biological þuids including blood and urine. The other matrices encompassing hair, saliva and sP _ re om Deýcient Transferrin) as a biomarker for chronic alcohol consumption and its role in diagnosing and monitoring alcohol use disorders. We also aim to enrich and add to the scientiýc debate and knowledge about the manifest reliability of this biomarker.*

KEYWORDS: *Alcohol use disorders, Biological markers, Laboratory ýndings, Alcoholism, Transferrin isoforms, CDT*

INTRODUCTION

Alcohol use is popular and wide spread around the globe. Alcoholism causes a myriad of medical and psychiatric syndromes and complications. For example, alcohol use is a major cause of road traf c accidents. The impact of alcohol abuse is re ected in the biological, psychological, and social domains of our lives. Therefore, there is pressing need for reliable, safe and speci c markers for early detection of potential alcohol abuse and follow up of recovering patients. Laboratory testing of alcohol consumption can be of an added value in identifying alcohol ingestion. Yet, the conventional biomarkers, including transaminase enzymes SGOT (AST) (Serum Glutamat p r G " r q l Glu w refers to the less sialylated forms of human transferrin: Asialo- and disialo-transferrin (Kent E Vrana et al.-March 25, 2011). It is presumed that alcohol intake of ≥ 50-80 g/day for a period of at least two weeks augments the increase of CDT concentrations. Despite the fact that mechanism of CDT increase still remains poorly understood, a large number of studies suggest and manifest that CDT is a good biomarker for the diagnosis of heavy alcohol consumption, with higher sensitivity and speci city than any of

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the other traditional markers. CDT has become a focal point for alcohol abuse research and clinical studies, besides forensic and judicial applications **(**Peterson, K.-2005, Steven Kipnis-2006).

The novel advances in proteomic technologies have immensely boosted the potential for alcohol abuse biomarker discovery. Quantification of Carbohydrate Deficient Transferrin (CDT) by capillary electrophoresis is used for screening patient serum samples to detect chronic alcohol abuse. Serum transferrin isoforms are separated into five major fractions according to their sialylation level. The human transferrin consists of several isoforms. Each

interrupted in women due to hormonal fuctuation and imbalance in situations of gestation, use of contraceptives, menstruation, menopause, etc. CDT levels are signifcantly affected by iron homeostasis. Many CDT assay methods appeared to be auspicious, but it is not clearly conspicuous which technique is the most precise and accurate. Furthermore, false-positive results of CDT have been notifed in non-alcohol related hepatic failure and in rare conditions. Subsequently, clinical interpretation of CDT result necessitates rigorous assessment in patients with alcohol-related or non-alcohol-related health problems. CDT levels below 1.3% are regarded as normal, but CDT levels above 1.6% are considered

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