Phosphatidylethanol

PETH A MARKER FOR PROLONGED ALCOHOL CONSUMPTION

Concentration PEth [µmol/L]	Comments
< 0,1	None or low intake
0,1 - 0,5	Moderate intake
> 0,5	Large intake

Phosphatidylethanol (PEth) in the blood is a biomarker for alcohol consumption and is one of the body unnatural phospholipid that can only be formed in presence of alcohol, which theoretically provides 100% diagnostic specificity for alcohol.

PEth has been found to be a better indicator for alcohol consumption than other biomarkers on the market.

The half-life of PEth in blood is 4-5 days, meansing that it in practice the molecule can bedetected up to 3 weeks after the alcohol have been cleared out of the blood

Description of the Biomarker

Phosphatidylethanol (PEth) is a generic term for a large group of phospholipids formed from the membrane molecule phosphatidylcholine in the presence of ethanol. PEth-16:0/18:1 is the most abundant individual form of the PEth-homologues and is used in quantitative LC-MS/MS analysis of blood from patients to estimate the level of alcohol consumption.

PEth formation after drinking alcohol are dose dependent and the marker is very useful to separate total sobriety, PEth is absent in the blood, to alcohol consumption when PEth is increased in the blood in relation to alcohol intake.

PEth is the only one biomarker which is correlated to alcohol consumption over time. Still no false positives have been reported in humans. Nor there are there endogenous or other drugs that interfere with the analytical method. In a clinical perspective, PEth is therefore, a 100% alcohol specific marker (1).

Value of the Biomarker

Alcohol is consumed globally and spans across all sociodemographic groups. A number of scientific investigartions has shown that the body is affected negatively by alcohol and that the alcohol consumption increases the risk for the development of many chronic diseases.

The alcohol consumption pattern has effect on a person disease state, both in acute and chronic diseases. Twenty-five chronic diseases and condition codes in the International Classification of Diseases (ICD) -10 are attributed entirely to alcohol. Alcohol consumption also correlate to the development of some cancers, neuropsychiatric disorders, and multiple cardiac and digestive diseases (4).

Early identification of individuals who are at risk of alcohol addiction increases the ability to intervene early, which will reduce the risk of developing diseases, and thereby reduce suffering and reduce costs for both the individual and healthcare providers [1,2,3].

Measuring alcohol consumption is also important, for preoperational evaluation, at emergency unit, occupational health services, driving license issues and in forensic

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Adress: % redhot diagnostics AB,
Forskargatan 20J, SE-151 36 Södertälje Tel: +46 (0)704 93 36 46
E-mail: info@redhotdiagnostics.com Web: redhotdiagnostics.com

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Every ten patient who come to the primary care unit have an alcohol related disease. PEth can be detected in the blood for up to 3 weeks after prolonged and heavy alcohol consumption and is therefore an biomarker to detect excessive alcohol intake

Description of Marker

The least detecable level is 0.05 µM

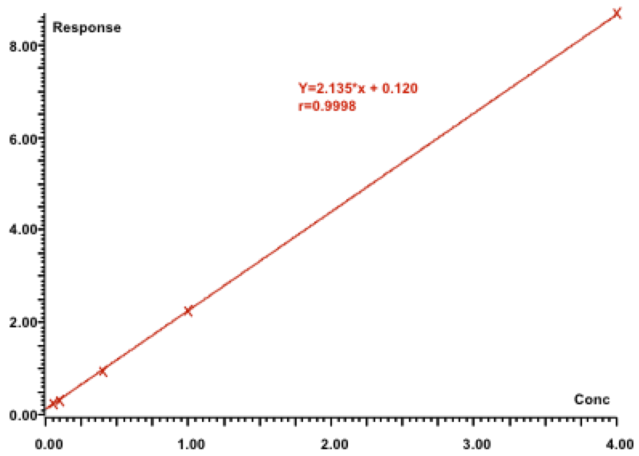
Measuring range

The calibrator range is 0.05 to 4 µM

Assay performance

Sample	[µmol/L]	Intra assay	Inter assay CV
QC low	0.15	< 12 %	< 15 %
QC mid	0.3	< 10 %	< 12 %
QC high	1.5	< 8 %	< 10 %

PEth calibration curve



The PEth method gives the ability to objectively characterize an individual's relationship to alcohol. The PEth test is the only test that can quantify alcohol-related diseases both for early intervention and research [5,6].

Intended use

This product should be used for LC-MS/MS application for the qualitative and quatitative analyse of PEth

Principles of the procedure

Phosphatidylethanol is extracted from whole blood by addition of totally 400 microliters of extraction solvent containing an internal standard (deuterated phosphatidylethanol) to 100 microliters of blood. After thorough mixing the msixture is centrifuged and an aliquot of the supernatant is injected in the LC-MS system, where components are separated on a reversed phase (C8) column using a binary gradient.

The effluent from column is monitored with electrospray ionization mass spectrometry using multiple reactions monitoring to follow the respective characteristic transitions for PEth and the internal standard. The ratios of the peak areas for PEth to the internal standard are used to quantify the concentration of PEth in the sample

Referenser

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E-mail: info@redhotdiagnostics.com Web: redhotdiagnostics.com

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