Brigham and Women's Hospital
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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

Phosphatidylethanol (PEth) levels among individuals with severe alcohol use disorder seeking inpatient withdrawal management

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Background

- Inpatient withdrawal management (i.e. "detox") is often the first step in recovery for individuals with alcohol use disorder (AUD). Despite various screening methods, predicting withdrawal severity remains challenging.[1]
- Phosphatidylethanol (PEth), a membrane-bound phospholipid, is synthesized exclusively in the presence of alcohol consumption. [2] Over 40 homologues are known to exist. PEth has a half life of 4-10 days and therefore is a marker for drinking in the last 2-4 weeks.
- PEth levels correlate well with self-reported heavy drinking in the prior several weeks or more, making PEth a useful biomarker to assess the degree of recent drinking.[3-5]
- A recent study found PEth levels to correlate with alcohol withdrawal symptoms in individuals with AUD seeking inpatient withdrawal management.[6]

Objective

- Primary aim is to determine if PEth levels on admission correlate with alcohol withdrawal severity among individuals seeking inpatient withdrawal management, defined by the total medication requirement in diazepam equivalents.
- Secondary aims are to correlate PEth levels with drinking history CIWA, AUDIT, and PAWSS scores.

Methods

- **Design**: Prospective study
- **Setting**: ASAM Level 4 inpatient unit (i.e. medically managed intensive treatment). All patients receive fixe-dose treatment with either benzodiazepine or phenobarbital. CIWA is obtained to determine if additional PRN doses are needed.
- **Procedures**: After obtaining informed consent, blood drawn for PO PEth and complete chart extraction.
- **Compensation**: Each participant received $30 for completing all study procedures.

Inclusion:
- Age ≥18yo
- English-speaking
- Admission for alcohol withdrawal treatment

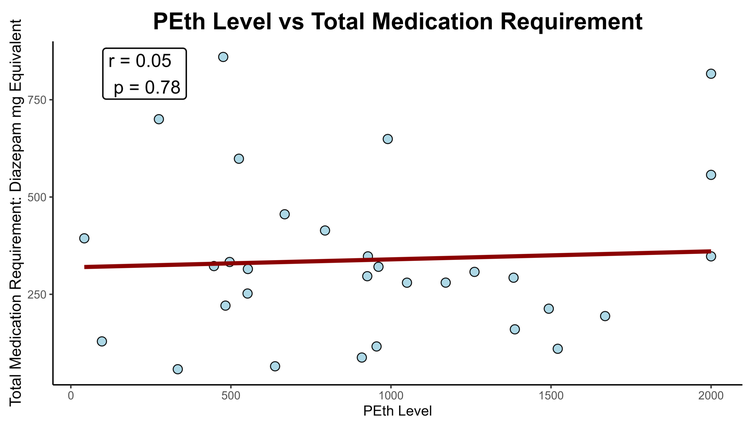
Exclusion:
- Impaired mental status that prevented informed consent
- Primary withdrawal management for other than alcohol

Primary outcome: Correlation between serum PEth and medication requirements in diazepam equivalents (10 mg diazepam = 2 mg lorazepam = 25 mg chlordiazepoxide = 30 mg IV phenobarbital)

Secondary outcome: Correlation between PEth levels with CIWA scores, drinking history, AUDIT, and PAWSS scores.

All statistical analyses were conducted in R Studio version 4.2.211. Descriptive statistics summarized the data.

Results



Summary of Participant Characteristics (n=31)

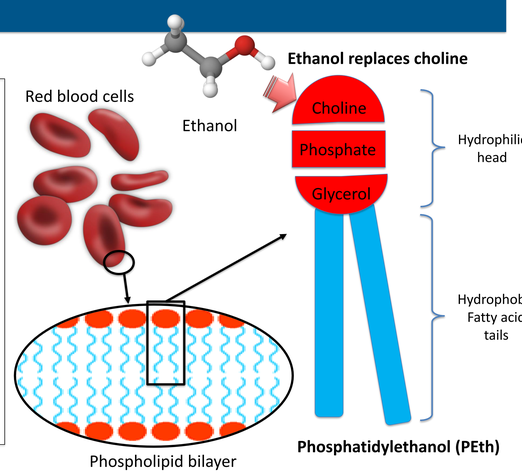
Age, mean (SD):	48.7 years (SD 11)
Sex (%):	67.7%77.4% Male
Race (%):	White; 25.8% Black

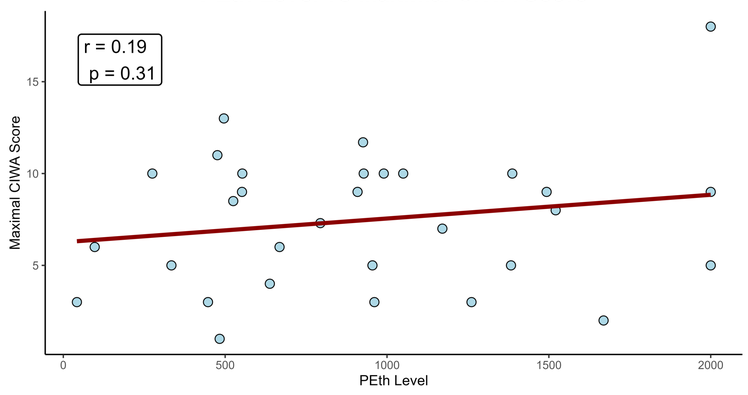
Common comorbid psychiatric diagnoses
- MDD (41.9%)
- Bipolar (16.1%)
- GAD (51.6%)

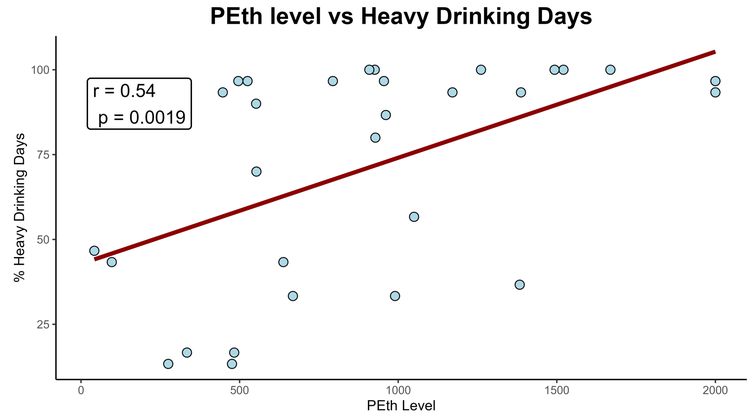
Alcohol history

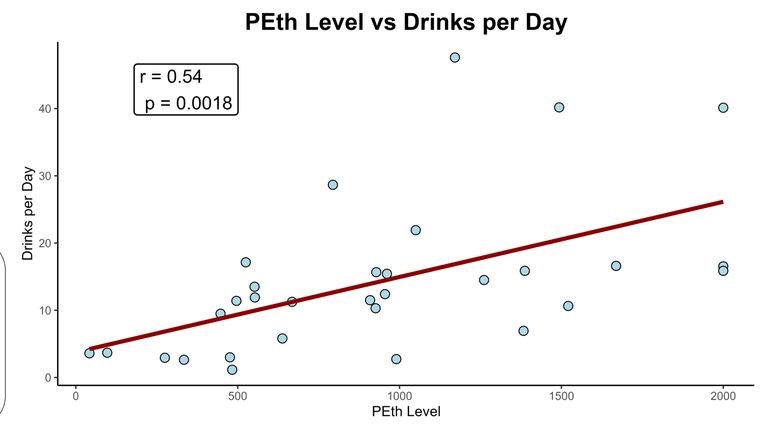
Drinks per drinking day, (M, SD)	14.2 (11.4)
Percent heavy drinking days (%, SD)	72 (31.9)
History of seizures (n, %)	9 (29.0%)
History of DTs (n, %)	7 (22.5%)
BAL on admission, M	182.0mg/dL
PEth, M	934.9ng/ml
Medication requirement	338.5mg

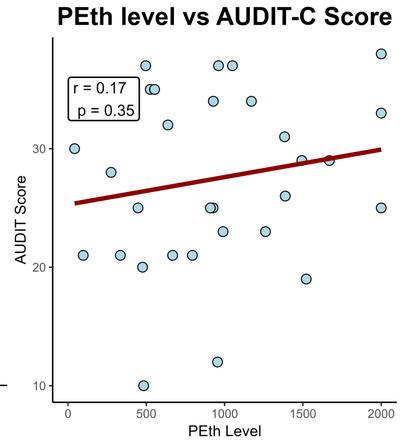
Other SUDs
- Tobacco (58.1%)
- Cannabis (25.8%)
- Cocaine (19.4%)
- Opioids (12.9%)

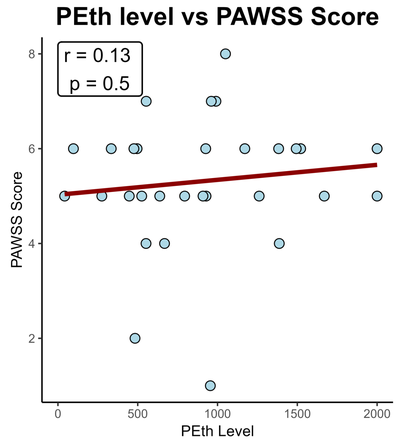












Conclusions

- Results indicate that, contrary to previous research, PEth levels did not significantly correlate with alcohol withdrawal severity as defined by medication requirement.
- PEth levels did positively correlated with recent self-reported alcohol consumption, supporting as a valuable biomarker to ascertain the degree of recent drinking.
- Participants in this study generally presented with more severe drinking patterns compared to those in a previous study, and the unit only admitted patients at risk for severe withdrawal. Thus, our results could potentially suggest a ceiling effect, where PEth's utility to predict withdrawal severity is limited beyond a certain threshold of alcohol use.
- Further studies conducted in various settings, with a wider spectrum of AUD severity, and with adequate sample sizes are needed to better assess the possible utility of PEth as a predictor of alcohol withdrawal severity.

References

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