

Cortical thickness abnormalities in abstinent substance-dependent individuals

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No conflict of interest

Introduction

- Addiction is associated with cortical thickness changes, most commonly cortical thinning.
- Some regional changes may be substance-specific, while others are associated with dependence in general.
- The effect of polysubstance dependence on cortical thickness is not well-understood.

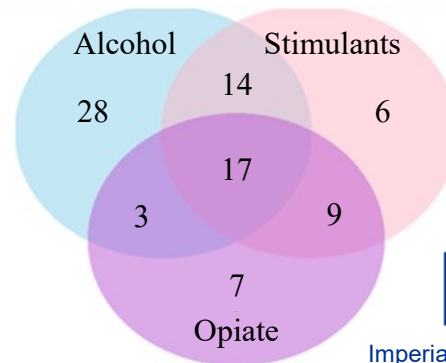
Aims

1. To identify cortical thickness changes present in all dependent individuals.
2. To identify cortical thickness changes present in alcohol-dependent (AD) individuals.
3. To compare cortical thickness between AD individuals with comorbid dependence on stimulants/opiates (ALC+) and alcohol-only group (ALC).

Study participants

The study utilised structural magnetic resonance imaging (MRI) data from healthy controls and abstinent individuals with a range of dependencies (figure 1), collected as part of the ICCAM platform.

Figure 1 Dependencies profile



Methods

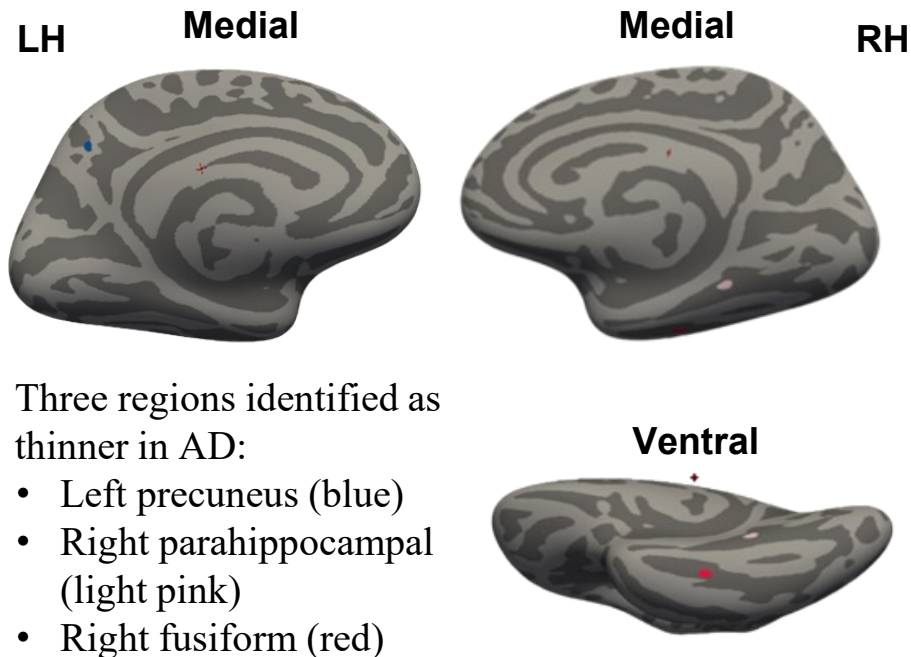
Whole-brain MRI analysis conducted in FreeSurfer to compare cortical thickness between groups matched for age, sex, IQ and education:

1. All dependent (n=84) and controls (n=56)
2. AD (n=60) and controls (n=59) (Figure 2)
3. ALC+ (n=32) and ALC (n=28)

Results

- No cortical abnormalities in all dependent individuals compared to controls.
- Significantly lower cortical thickness in three regions in AD compared to controls (Figure 2).

Figure 2
Localised thinning in AD individuals



LH – left hemisphere
RH – right hemisphere

Results

- No differences between ALC+ and ALC in cortical thickness.
- Different patterns of interaction of cortical thickness with alcohol exposure (Figure 3) and abstinence length (Figure 4) in ALC and ALC+.

Figure 3 Cortical thickness and lifetime alcohol exposure (normalised by age)

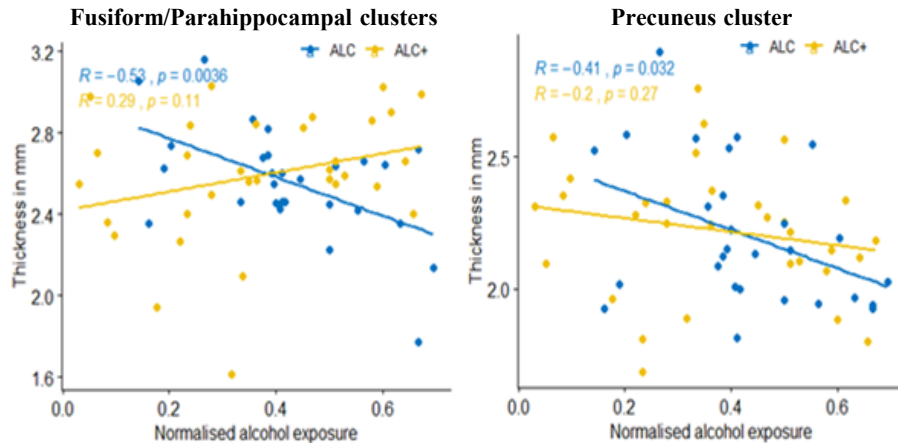
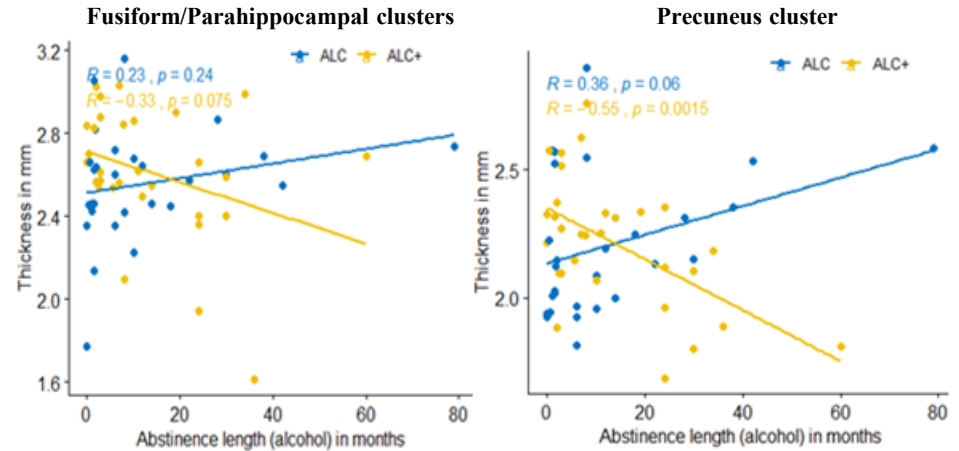


Figure 4 Cortical thickness and abstinence length



Conclusions

Dependence on different substances may distinctly affect brain structure (thus, no shared abnormalities in all dependent individuals).

Cortical thinning in AD was identified and may have clinical implications.

Cortical recovery may be hindered by co-dependence on other drugs in alcohol-dependent group.