Subjective Cognitive Decline (SCD): a precursor to Functional Cognitive Disorder?

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Introduction

It is relatively common to experience cognitive difficulties in the absence of objective cognitive problems[1]. Subjective Cognitive Decline (SCD) sometimes occurs as an early stage of neurodegeneration, but can also occur in the healthy normal population, and those with Functional Cognitive Disorder (FCD). We need population based data to understand trajectories, since clinic based samples are not representative.

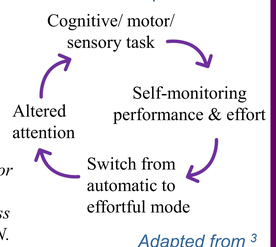
FCD (the cognitive variant of Functional Neurological Disorder) may be more common than recognised. A key component in the diagnosis is cognitive internal inconsistency[2] (when someone is able to do a cognitive process in some times or contexts, but at other times demonstrably cannot), though we don't yet have agreed reliable measurements of this.

Population based data can help us understand the likely trajectories of people with SCD, and whether this represents a step in the pathway towards FCD.

Functional Cognitive Disorder

Phenomenology: heightened insight, "cognitive fog". Typical symptoms mirror cognitive lapses seen in normal population: word finding difficulties, loss of thread of conversation, forgetting PIN.

Proposed model:



Adapted from [3]

Aims

To understand, at the population level

1) What is the relationship between objective and subjective cognitive decline?
2) Do people with SCD show evidence of cognitive internal inconsistency?
3) Does SCD predict later dementia, or make it less likely than for the rest of the population?

Method

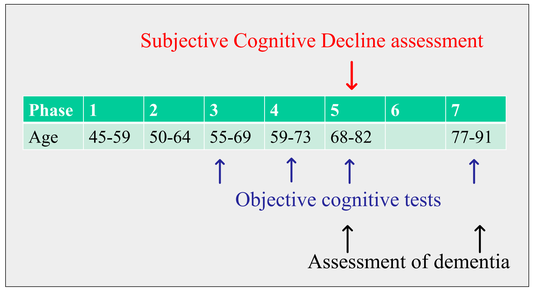
The Caerphilly Prospective Study has followed men in this region of South Wales since 1979. It has rich longitudinal data, including cognitive assessments.

Caerphilly, South Wales

Amongst this men-only sample (n=1225), 30% had significant SCD (at phase 5, ages 68-82).

6% met criteria for dementia at age 68-82, and a further 6% at a later phase (age 77-91). Note the participation rate was only 50% at the later date, but we also have diagnostic data from the local cognitive clinic.

Cognitive assessments included the CAMCOG and the Rivermead Behavioural Memory Test (RBMT). We defined objective cognitive decline as an annual drop more than one standard deviation below the mean CAMCOG score. SCD was measured via self-report of memory and concentration over time. We defined cognitive internal inconsistency as a higher score on delayed recall versus immediate recall (RBMT story recall task).



We ran regression models in STATA. Due to attrition, analyses to phase 7 were run using complete case analysis, and checked using multiple imputation (MICE).

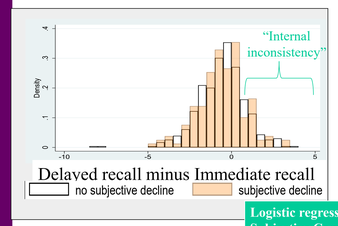
Results

SCD was a poor marker of objective cognitive decline:

(%)		Objective decline (CAMCOG)	
		YES	NO
Subjective decline	YES	True positive (9)	False positive (21)
	NO	False negative (17)	True negative (53)

Amongst those with no preceding objective cognitive decline, we examined the story recall task on RBMT (using "delayed recall > immediate recall" as a marker of cognitive internal inconsistency).

- Those with SCD had worse immediate recall than those without SCD (5.55 vs 6.15, p=0.02)
- Those with SCD were equally likely to show cognitive internal inconsistency as those without SCD (delayed recall – immediate recall -0.84 and -0.83, p=0.92)
- We also noted approximately 1/5 of both groups had this marker of cognitive internal inconsistency:



Scores higher than 0 indicate Delayed Recall higher than Immediate Recall (one possible measure of cognitive internal inconsistency)

Logistic regression model showing the only significant predictors of SCD (phase 5) were age, poor sleep, and anxiety (no prediction from vascular risk markers nor objective cognitive change).

Logistic regression : Subjective Cognitive Decline	Adjusted OR (95% CI)
Age (years)	1.11 (1.05-1.17)
Social class (manual/non-m)	0.95 (0.62-1.46)
Premorbid IQ	1.05 (0.83 – 1.32)
High alcohol use	1.20 (0.70-2.07)
Teetotal	0.60 (0.29-1.27)
Probable Ischaemic heart dis	1.03 (0.61-1.72)
Number of vascular drugs	1.20 (0.93-1.54)
Smoking	0.85 (0.56-1.30)
Waist-hip ratio	0.89 (0.63-1.27)
Poor sleep	1.55 (1.21-1.99)
Sleep- disordered breathing	1.12 (0.90-1.40)
Mood symptoms (GHQ)	1.23 (0.97-1.55)
Trait anxiety (STAI)	1.39 (1.09-1.76)
Rate of decline CAMCOG	1.18 (0.72 – 1.95)
Rate of decline AH4	1.36 (0.97 – 1.92)

- SCD at age 68-72 (phase 5) did not predict later dementia (age 77-91, phase 7): OR 1.35 (0.61 – 2.99)

Conclusions

SCD is common at the population level, and is associated with older age, prior anxiety, and prior self-reported poor sleep. It does not index a greater liability to future neurodegeneration.

This is different to the trajectories of people with SCD seen in clinic, where there may be other features (e.g., concern from relatives, evidence of poor performance of everyday activities), putting them in a different risk group regarding future neurodegeneration.

People who have SCD, alongside no objective evidence of cognitive decline, had difficulties with immediate recall (a marker of attention or working memory). But they were not especially prone to having delayed recall greater than immediate recall (which would be one example of cognitive internal inconsistency).

Implications

Patients presenting to clinic with SCD are heterogeneous, and are not necessarily *en route* to neurodegeneration.

"One off" evidence of cognitive internal inconsistency is quite common in a general population sample.

Those with SCD but no evidence of objective cognitive difficulty, have mild difficulty with attention or working memory. This introspective group may be "using up" some of their attentional resource on tracking their cognitive performance. This group may therefore be susceptible to Functional Cognitive Disorder. However, further longitudinal data are required to test this.

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References: 1) McWhirter et al 2020: Functional cognitive disorders: a systematic review *Lancet Psychiatry* 7: 191-207.
2) Ball et al 2020: Functional Cognitive Disorder: dementia's blind spot *Brain* 143: 2895-2903
3) Teodoro et al 2018 A unifying theory for cognitive abnormalities in functional neurological disorders, fibromyalgia and chronic fatigue syndrome: systematic review *JNNP* 89: 1308-1319