Brain Injury Psychiatry Workshop

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Apathy

Case 1

- 48 yr old married father, CALD background, high powered exec role. Extremely severe TBI (PTA 50 days) 2 yrs prior, MVA v pedestrian. MRI- L. anterior frontal contusions and DAI.
- Physically recovered well aside from some reduced ROM L. upper limb
- Significant ongoing issues with memory, attention, fatigue, concentration and language
  - Carers 6hrs/day, reduced over time
  - OT: Road safety, memory strategies, planning tasks, study options, vocational provider
  - Physio: Shoulder ROM, exercise program
  - Speech: Word retrieval, reading comprehension, auditory comprehension
  - SW: Finances, support for wife
  - Case management: Liaison with carers, relevant financial parties, goal setting

PTA= Posttraumatic amnesia, orientation and memory for ongoing events

Case 1

- Low mood and aggression- seeing psychologist, difficulty accepting change in role. Psychoeducation, cognitive behavioural therapy for adjustment/irritability/mood
- Expressed suicidal ideation- referred to psychiatry clinic
- Hopeless with poor mood, energy, motivation, sleep. Antidepressant commenced which helped with mood fluctuations and anger, melatonin helped with sleep
- Ongoing prominent lack of initiation and drive, spending most of day watching Youtube and not attending study course as “boring”. Lying in bed until compelled to emerge by wife, wouldn’t instigate conversation or activities

Apathy

- Reduction in motivation and goal-directed activities:
  - Behaviours (lack of effort, initiative, and productivity)
    - Emotional concomitants of behaviours (flattened affect, emotional indifference, restricted emotional responses to important life events)
  - Cognitions (decreased interests, lack of plans and goals, lack of concern about one's own personal problems)

Starkstein SE, Leentjens AF: The nosological position of apathy in clinical practice. J Neurol Neurosurg Psychiatry 79(10):1088–1092, 2008

Differentiating apathy

- Can be reversed by external stimulation v pathology of the neuromuscular system
- Overlap with depression- loss of interest and pleasure
- Cognitive deficits may impair pursuit of pastimes and iADLs

Glenn MB, Burke DT, O'Neil-Pirozzi T, et al: Cutoff score on the apathy evaluation scale in subjects with traumatic brain injury. Brain Inj 16(6):509–516, 2002

Starkstein SE, Merello M: Psychiatric and Cognitive Disorders in Parkinson's Disease. Cambridge, UK, Cambridge University Press, 2002

Abulia

- Conceptualised as more severe type of apathy with lack of self-initiation and self-regulation of purposeful behaviour and concern, and severely impaired ability to communicate
- Difficulty initiating and maintaining purposeful movements, poverty of spontaneous movements, reduced spontaneous speech, increased response time, reduced social interaction

Vijayaraghavan L, Krishnamoorthy ES, Brown RG, et al: Abulia: a delphi survey of British neurologists and psychiatrists. Mov Disord 17(5):1052–1057, 2002

Apathy- Proposed mechanism

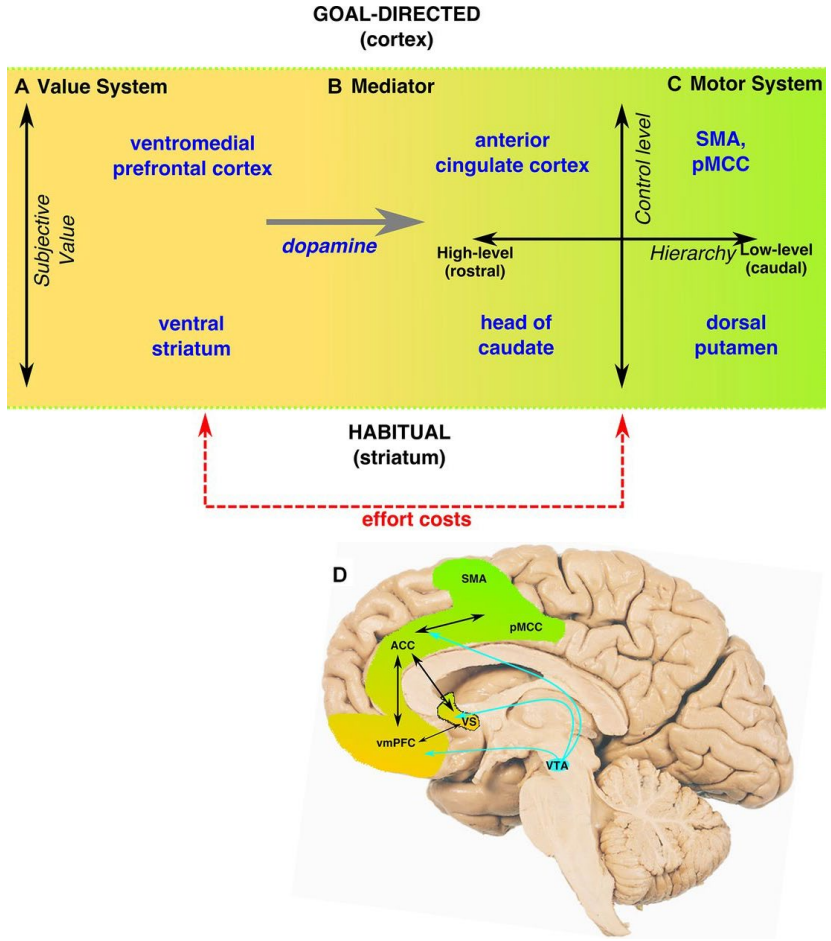
- Le Heron et al- Three fundamental processes
- Premise: importance of outcomes for motivating behaviour - philosopher and physician John Locke ascribed a crucial role for reinforcers (pleasure and pain) for motivating actions, writing that without these perceptions

"… we should have no reason to prefer one thought or action to another … and so we should neither stir our bodies, nor employ our minds, but let our thoughts (if I may so call it) run adrift … In which state man … would be a very idle, inactive creature, and pass his time only in a lazy lethargic dream."

Le Heron C, Holroyd CB, Salamone J, et al. Brain mechanisms underlying apathy. Journal of Neurology, Neurosurgery & Psychiatry 2019;90:302-312.

Apathy- Proposed mechanism

- Complex network of reciprocally connected cortical and subcortical brain regions, under the influence of the mesolimbic dopaminergic system.
- Internal valuation system must determine the subjective value of ongoing events in terms of hedonic or aversive potential + potential costs, including energy expenditure. Ventromedial prefrontal cortex (vmPFC)
- Mediating system integrates this reinforcer/cost information to activate the motor system towards particular goals. Ventral striatum (VS), anterior cingulate cortex (ACC) and mesolimbic dopamine (originating in VTA) form the mediating system.
- Motor system produces behaviour towards motivationally relevant stimuli. Hierarchically organised from complex/high-level to subcomponent/low-level and from goal-directed/cortical to habitual/sub-cortical. Posterior mid-cingulate cortex (pMCC), supplementary motor area (SMA), ACC and dorsal striatum (including the caudate and the putamen)
- Implication: measures to increase the incentivising value of rewards are an important therapeutic target



Le Heron C, Holroyd CB, Salamone J, et al. Brain mechanisms underlying apathy. Journal of Neurology, Neurosurgery & Psychiatry 2019;90:302-312.

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Apathy- frequency and correlates

- Approx half of patients at some stage in the post-severe TBI period
- Baseline apathy was not associated with apathy 1 year later, suggesting reversibility
- Negative impact on rehabilitation efforts and social integration
- Anger, apathy, and dependency cause the greatest distress for caregivers

Rao V, McCann U, Bergey A, et al: Correlates of apathy during the first year after traumatic brain injury. Psychosomatics 54(4):403–404, 2013

Arnould A, Rochat L, Azouvi P, et al: A multidimensional approach to apathy after traumatic brain injury. Neuropsychol Rev 23(3):210–233, 2013

Marsh NV, Kersel DA, Havill JH, et al: Caregiver burden at 1 year following severe traumatic brain injury. Brain Inj 12(12):1045–1059, 1998

Apathy- management

- Avoid stressful situations and interference, clear and precise instructions, verbal reminders with cues, writing important information and encouraging patients to do this, persisting and helping the patient to persist in the use of tools and strategies
- Planned care itineraries and occupational and social activities, as well as cognitive-behavioural and family therapy

Wiart L, Luauté J, Stefan A, et al: Non pharmacological treatments for psychological and behavioural disorders following traumatic brain injury (TBI). A systematic literature review and expert opinion leading to recommendations. Ann Phys Rehabil Med 59(1):31–41, 2016

Apathy- management

- Studies consisted of single patients/small samples, with proper, adequately powered RCTs needed
- Available evidence suggests that psychostimulant medication may reduce apathy in some post-TBI (methylphenidate)
- 2nd line- cholinesterase inhibitors (donepezil)
- Dopamine agonists- amantadine

Plantier D, Luauté J, SOFMER group: Drugs for behavior disorders after traumatic brain injury: systematic review and expert consensus leading to French recommendations for good practice. Ann Phys Rehabil Med 59(1):42–57, 2016

Case 1 update

- Recently commenced on methylphenidate, improvement in concentration and memory but not in motivation
- Monitoring for any increase in aggression, anxiety, instability of mood or deterioration in sleep
- Ongoing