CBT for (persistent) Post Concussion Syndrome

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MTBI and PCS: Definitions

- Mild traumatic brain injury (MTBI) ~ concussion
- ACRM (1993) criteria: traumatically-induced physiological disruption of brain function
  - Indicated by any LoC; any amnesia for events around accident; alteration in mental state (e.g., feeling dazed, disoriented, or confused); or focal neurological deficit(s) (LoC of ≤ 30 minutes; GCS 13-15; PTA ≤ 24 hours)
- Postconcussion symptoms (PCS)
- A constellation of symptoms occurring after TBI, especially associated with mild TBI:
  - **Physical** (fatigue, headache, dizziness, sensitivity to noise)
  - **Cognitive** (subjective / objective difficulties with concentration and memory)
  - **Emotional** (irritability, anxiety, depression)
  - **Other** (insomnia, less tolerant of alcohol, preoccupation with brain injury)
MTBI and persistent PCS

- Annual incidence of MTBI between 1.8% to 5% of general population (Kurtzke & Kurland, 1993; Bazarian et al, 2005)
- Symptoms are common in the majority, but typically improve in the first three to six months after mild TBI.
- Some experience persistent symptoms: Ruff et al’s (1996) “miserable minority”
  - Some estimates of prevalence at 10-20%, but methodological issues such as recruitment bias may lead to overestimates (McCullagh & Feinstein, 2003; Demakis & Rimland, 2010)
  - 5% may be nearer the mark (McCrea, 2007)
  - Inconsistencies/lack of clarity in various criteria for defining (mild) TBI, symptoms associated with PCS, how long symptoms last before they’re viewed as persistent, hence lack of consensus (Carroll et al, 2004; Marshall et al, 2012)
- Longer-term follow-up suggests no change (Elgmark Andersson et al, 2011) or even deterioration (Zumstein et al, 2011)
Organic or psychogenic?

- Debate about PCS has typically focussed on the contribution of persisting direct effects of brain injury (especially on cognition) versus other factors…

- “It is necessary for once to abandon the specious dichotomy between organic and psychogenic, in an approach to head injury” (Strauss & Savitsky, 1934)

- “I believe that we have no unequivocal criteria, no final distinction, between physiogenic and psychogenic because the search implies a dualism which is not there… the doctor taking care neither to hunt the snark of physiogenesis to death, nor perfervidly to track the red herring of moral obliquity (“gold digging”, “scrim-shanking”) to its lair.” (Lewis, 1942)

- “… the sterile debate concerning the psychological vs. organic origins of symptoms.” (Wood, 2004)
Organic or psychogenic (after Lishman, 1988)

Direct effects of TBI

Effects of other factors (e.g. pre-injury variables, “psychological” reactions, psychosocial stressors, coping strategies, medicolegal issues etc)

R Residual, persisting direct effects of TBI (assumed to vary as a function of injury severity and time since injury)
CBT for PCS: Psychological factors?

- Postconcussional symptoms are considerably non-specific
  - Overlap with psychiatric syndromes (anxiety, depression, PTSD) and other disorders (e.g. chronic fatigue) is high
- Role of medicolegal involvement (Binder & Rohling, 1996)
- “Good old days” bias
  - Individuals with persistent symptoms tend to under-report “normal”/pre-injury symptom levels compared with general adult controls (e.g. Mittenberg et al, 1992)
- Illness perceptions
  - Expectations at 1-3 weeks post-injury that symptoms were likely to persistent and would have major consequences predicted symptoms at 3 months post-injury (Whittaker et al, 2007)
    - No contribution of injury severity (GCS/LoC) or comorbid psychiatric symptoms (anxiety/depression/PTSD) in multivariate analysis
  - Similar findings for illness perceptions predicting persistent PCS at 3 and 6 months post-injury (Hou et al, 2012), along with “all-or-nothing” coping
    - Again, no contribution of psychiatric symptoms in multivariate predictions
Themes in CBT for PCS

- Treating co-morbid problems
- Behavioural aspects
  - Ultimate goal is focussing on sustainable levels of / increasing tolerance to effort / activity, and building upon this.
  - Understanding the role of avoidance (kinesiophobia & cogniphobia; travel phobia, social anxiety and agoraphobia; elements of depressive apathy)
- Symptom attribution
  - Focus on cognitive/behavioural responses to symptoms (rather than attributions regarding their causes) may be more helpful.
  - Although individuals with a 100% organic explanation may find it difficult to engage with psychologically-orientated models
Themes in CBT for PCS

• Dealing with high standards / self-criticism
  • Clinical perfectionism (Shafran et al, 2002): dichotomous attitudes to performance and procrastination are common themes

• Addressing cognitive problems
  • Re-attributing cognitive difficulties to causes other than persisting direct effects of brain injury (or at least taking them into account)
  • Managing the impact of mistakes / frustrations on mood and behaviour
  • Rather than improving memory, improve confidence in memory [metamemory]
PCS in MTBI vs. chronic pain

![Bar chart showing comparisons between MTBI (Smith-Seemiller et al, 2003) and Chronic Pain (Smith-Seemiller et al, 2003) for average item rating on RPQ, Somatic Sx (per item), Emotional Sx (per item), and Cognitive Sx (per item). Controls (Chan, 2001) are also shown.](chart_image)
Mini-formulation of cognitive difficulties

Anticipatory anxiety
- Challenge to memory or other abilities (e.g. remembering someone's name)
  - Increasing stress, reduced thinking capacity, reduced fluency

Performance anxiety
- Even more (di)stress, even less thinking capacity, even less fluent
  - Attention to extra effort required / possible mistakes or errors

Self-critical post-mortems
  - Even more (di)stress, less thinking capacity, less confidence in own abilities, wary in future about similar tasks, avoidance etc.

I've failed completely. I'm incompetent.
I can't do this. My memory is awful.
I'm not going to be able to cope. I'm going to mess this up.

Anticipatory anxiety
Performance anxiety
Self-critical post-mortems
PCS: Evidence for treatment

- Psychological treatment reviewed in Al Sayegh et al (2010)
- Some evidence for prophylactic effects of early psychoeducation and reassurance (Mittenberg et al, 2001)
  - Targeting at-risk individuals may be indicated (Ghaffar et al, 2006; Silverberg et al, 2013)
- Persistent symptoms have traditionally been seen as resistant to available therapies and difficult to treat (Mittenberg et al, 1996)
  - Handful of case studies or case series, usually focusing on particular symptom domains (e.g. dizziness - Gurr & Moffat, 2001)
  - One small (N=20) waiting list controlled RCT (Tiersky et al, 2005) using an intensive combined CBT/cognitive remediation program (55 hours) demonstrated positive findings
    - Improvements noted in general symptoms, those associated with anxiety & depression, and on one test of cognitive functioning, but not in subjective attentional difficulties or problem-solving
CBT for PCS: RCT

- Rationale and protocol for trial in Potter & Brown (2012); results paper in review...
- RCT with waiting list control
- Predominantly (80%) mild-moderate TBI
- At least 6 months post-injury
  - 52% more than 2 years after
- 72% involved in a medico-legal claim
- 12 sessions 1:1 CBT
  - Relatively flexible formulation-driven structure due to heterogeneity of presenting problems
Person-centred health status (QOLAS)

Time:
F(1,43) = 23.0; p = 0.00

Group x Time:
F(1,43) = 5.6; p = 0.02
Postconcussional symptoms (RPQ)
Postconcussional symptoms (RPQ)

Time:
F(1,43) = 21.2; p = 0.00

Group x Time:
F(1,43) = 0.5; p = 0.47

Supplementary analyses on somatic, emotional and cognitive symptoms showed similar effects of time without interactions.
Effect of treatment duration

- Illustrated with a median split comparison of the CBT group
  - Divided into “slower” and “quicker” completers
- Consider RPQ scores
  - No differences at baseline
  - “Slow” group similar to controls, “quick” group show greater improvements
- Possible effects of:
  - treatment intensity?
  - treatment engagement?
RCT: Re-analysis summary

• When adding the interval between outcomes as a covariate, the positive findings for CBT from the initial analysis remain:
  • Shorter intervals associated with better outcomes
  • CBT effects not due to spontaneous recovery just because we “kept” them in treatment longer

• Evidence of benefits associated with CBT
  • General postconcussional symptoms (RPQ) and quality of life (QOLAS, EuroQol, BICRO)
  • Other secondary outcome measures showed improvement (HADS-anxiety, fatigue, anger) but not all (HADS-depression, PTSD or pain)
Effect of co-morbid anxiety & depression (on HADS)
CBT for PCS: outstanding issues

• In relation to our current trial:
  • How does the waiting-list group respond to CBT?
  • Are improvements maintained/capitalised upon after follow-up?

• Broader treatment issues:
  • What factors moderate treatment effects?
    • No major effects of injury severity; length of time since injury or medicolegal status in our RCT
    • Which psychological variables are important?
  • How much better is better?
    • CBT not a panacea!

• Design and format of therapy
  • Session number / individual vs. group
  • Use of follow-up / “booster” sessions in clinical practice
  • Coordination with other therapy disciplines (e.g. neuropsychiatry/medication; physiotherapy/dizziness)
CBT for PCS: outstanding issues

- Where to offer it?
  - Primary care?
    - Not necessarily treating comorbid anxiety/depression
  - Secondary care?
    - Variable/limited availability to psychological input in community brain injury teams
  - Tertiary care?
    - Harder to access (geographically/clinically)
- Internet-based but therapist-guided CBT?
  - Current development project
That's all Folks!