A desensitization program using a driving simulator to treat post-traumatic stress disorder following a motor vehicle collision: a case-study in progress.

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Post-Traumatic Stress Disorder (PTSD)

- Prevalence
  - Crash / Collision survivors, military

- Risk factors
  - Events, consequences, ...

- What are the common treatment for PTSD?
  - Desensitization
  - Associated health issues
VIRTUAL REALITY AND PTSD
Case study

- Mr. EF (55y.o.) who was diagnosed with post-traumatic stress disorder (PTSD) in 2010 after he was involved in a motor vehicle collision (MVC).
  - Driving at night on a two-lane undivided highway
  - Truck in the oncoming lane, driven by a drowsy driver, drifted across the center line
  - In order to avoid a head-on collision, Mr. EF steered his car abruptly into a ditch where it overturned.
What has been done?

• After the crash:
  – Mr. EF expressed severe anxiety and fear related to being hit by other vehicles.
  – Even as a passenger, he manifested anxiety and these symptoms were more present and severe at night in situations similar to the MVC he experienced.
  – Mr. EF is highly motivated to resume his normal life by driving again.
    • However, despite multiple attempts under the guidance of therapists, Mr. EF remains afflicted by debilitating anxiety and fear and has not been able to drive since then.

• N.B. I don’t want to critic what has been done before but only referred to it to give you a proper presentation of the case.
Consequences

• Medications
  – Ativan, Citalopram, Celexa, Séroquel...

• PTSD
  – March 29, 2010

• Driving
  – Stop driving
  – Experience as a passenger
Abitibi to Montreal

• Highly motivated to resume independant driving

• Contacted Virage Simulation

• CAA-Québec

• SAAQ
Objectives

• Evaluate the impact of a therapeutic treatment consisting of progressive exposures to simulator-based driver training scenarios to reduce levels of anxiety and stress while he executes normal driving behaviours.
Hypothesis

• By having access to cognitive refraining program, driving specific feedback and a practice environment, Mr. EF will be able to:
  • Visualized his own driving behaviors
  • Put in place appropriate responses
    – Driving behaviors
      » Lavallière et al. 2012a
      » Romoser et Fisher, 2009
    – Psychological and physiological responses
      » Bouchard et al. 2012
      » Lavallière et al. 2012b
Methods

• A driving-specific feedback program aimed at desensitizing driving fears was introduced to enable a cognitive reframing of the traumatic MVC event.
  – Cognitive-behavioural reframing strategies, mindfulness training and relaxation periods.
  – Driving simulator practice period
    • CAA-Qc in Pointe-Claire (Montreal, QC)

All intended to ensure that Mr EF will be able to cope properly with different real world driving situations.
Why a driving simulator?

- Safe environment
- Successful with other clienteles
  - TBI, Stroke, ...
Protocol

• Suggested structure
  – What was planned
    • Access to simulator
    • Rural to urban environment
    • No/Low to high traffic density
    • Automatic to manual control of the simulator
    • On-road
What happened...

Results: visit 1, December 2, 2013

• Able to sit in the car seat of the simulator and hold the steering wheel on two occasions.
  – No driving

• Physiological response
  – Sweat and high level of stress
  – During the session, Eric vomited more than once and one of those times he was on the simulator.

• Perceived capacity
  – Perceptibly more relaxed than before as a passenger and this greater calmness has persisted.
Postpone the simulator treatments due to winter road conditions

WHAT’S NEXT?
Discussion

• Patience, patience, patience

• Limitations
  – Severity of the PTSD
  – Prolonged time without driving
  – Associated medications
Conclusion

• Access to rehabilitation facility
  – Urban sprawl
  – Availability of such services

• Development of new curriculum of interventions
  – Technologies
  – Practices and curriculum
Questions
Thank you
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