SRTP Project Description
Summer 2015

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Project Title: Investigating the relationship between gait, depression, and mind-body therapy in seniors

Project Description – include background, hypothesis, proposed methodology, and expected outcomes (one page maximum; you may attach a page to this form):

Background

Falls are the leading cause of injury-related death in senior populations (i.e. 65 years of age and older) [1]; approximately 30% of community-dwelling seniors suffer a fall at least once per year, with this proportion increasing with age [2]. In Canada, 40% of falls by seniors result in hip fractures which oftentimes leads to only partial recovery [3], therefore it is not uncommon for older adults to report a fear of falling (FOF). FOF is particularly common in community-dwelling older females and those who have previously experienced a fall [4,5]. In some individuals, FOF actually leads to activity avoidance [5]. Moreover, seniors who have suffered a fall report reductions in their quality of life [6]. A systematic review by Scheffer et al. [4] has identified the major outcomes of FOF to be reductions in physical and mental health, quality of life and an increased risk of fall. Older adults suffering symptoms of depression are also more likely to have a severe FOF, leading to activity restriction in this group [7, 8]. As such, minimizing the risk of falls in older populations has important implications for the physical and mental wellbeing of individuals in this cohort.

Among the risk factors that increase the likelihood of seniors suffering a fall are gait impairments [9] and depression [10-12]. Indeed, measures of gait can be used to predict future falls [13] while increases in depressive symptoms are associated with increases in fall rate [10]. An association has been established between depression and gait deficits, even when confounding variables such as socio-demographic and overall health status are controlled; specifically, depression is associated with reductions in various gait parameters including gait velocity, stride length and swing time variability [14, 15]. At present, antidepressants are the first line of treatment for depression, however in seniors the response rate to an antidepressant trial of adequate dose and duration is often inadequate and can be as low as 30-40% [16]. In

addition, antidepressant use is often associated with a number of adverse events including increased fall risk [11] and impairments in gait [17, 18]. For example, in healthy seniors, a single dose of amitriptyline led to gait impairments when subjects were required to walk in the presence of obstructions [17]. Therefore the relationship between depression, gait, and fall risk is further complicated by standard pharmacological treatment practices for this population.

In recent years, various non-pharmacological interventions have been embraced by patients with late life depression (LLD). Loosely defined as mind-body therapies, these include biofeedback, energy healing, meditation, guided imagery, and yoga [19, 20]. Amongst these practices, meditation therapy may be of particular benefit for older adults with gait impairments and LLD; meditation is non-invasive, easy to learn, has negligible side effects, can be practiced from anywhere and has been shown to have multi-organ benefits [see 21 for a review]. Whilst relatively few studies have examined the effects of meditation on gait, a study of mindfulness-based cognitive therapy (MBCT) found the therapy normalized gait patterns in adults with a history of depression [22]. Additionally, a particular type of meditation, referred to as automatic self-transcending meditation (ASTM) has been shown to reduce symptoms of depression [23]. Currently, our research team is commencing the data collection phase of an REB approved study that has received funding by the Academic Medical Organization of Southwestern Ontario (AMOSO) Innovation Fund. This study is a single blind longitudinal naturalistic randomized control trial targeting individuals with late-life depression, and will examine the effects of ASTM on autonomic and mood-related symptoms of depression. In the framework of the ASTM study there is an opportunity to more closely examine the relationship between gait and depression in elderly populations, as well as the potential benefits of this mind-body therapy on gait and FOF. We are kindly requesting funding from the Department of Psychiatry to carry out this investigation. Specifically, we aim to assess gait parameters such as stride length and gait velocity, which have been shown to be affected by depression [14, 15], in LLD patients receiving ASTM training in addition to their current treatment schedules (ASTM group) as well as those that continue with their treatment as usual (TAU group). A thorough literature and clinical trial registry search reveals that no one has previously, or is currently, examining the effects of ASTM training on parameters of gait in LLD patients.

Study Objectives & Hypotheses

The aim of the proposed study is to develop a more comprehensive understanding of the relationship between gait impairments and LLD whilst concurrently investigating the use of ASTM therapy as a complementary treatment for gait deficits in this population. Specifically, this study would allow for two primary research questions to be investigated; firstly, is there a correlation between depression severity and gait deficits in elderly populations? Secondly, does ASTM training have any effect on gait, and if so, do these effects last beyond the 12-week

program (i.e. will any effects be present at 24 weeks)? Along with the primary research questions, the effects of ASTM training on FOF will also be examined.

We hypothesize that there will be an association between the presence and magnitude of gait impairments and the severity of depressive symptoms. We also hypothesize that individuals in the ASTM group will demonstrate marked improvements in gait parameters following ASTM training and that these improvements will be sustained beyond the duration of therapy (i.e. at 24 weeks). Lastly, relative to the TAU group, we expect to see a reduction in FOF after intervention in the ASTM group.

Research Environment - Description of the number of research personnel, size of lab, etc.: **Methods**

This is a part of a larger study that recruit elderly patients with late life depression for ASTM. As such there is a full team with 2 geriatric psychiatrists (Amer Burhan and Akshya Vasudev), a family doctor (Dr. Stephen Wetmore), a resident, a post doctoral fellow and an RA.

Participants in the ASTM study will be randomized into two treatment arms (ASTM or TAU) using an online random allocation software [24]; those who complete a 12 week meditation training program in addition to their existing treatment plan (ASTM arm) and those who continue with their existing treatment schedule as usual (TAU arm). As part of the larger ASTM study, assessments of depression severity will be completed at specific times over the 12 week training period: at Weeks 0, 4, 8 and 12. In order to examine whether any effects of meditation therapy are long lasting, mental health assessments will also be completed at 24 Weeks (12 Weeks after the meditation program has ended) in the ASTM group only. This study seeks to minimize the additional commitment of the participant, thus gait measurements will be obtained at each of the 5 mental health assessments (Week 0, 4, 8, 12 & 24) using a portable walkway with embedded pressure sensors (GAITRite®, CIR Systems Inc., NJ, USA).

Expected Objectives/Accomplishments for Student for Year 1: This study seeks to minimize the additional commitment of the participant, thus gait measurements will be obtained at each of the 5 mental health assessments (Week 0, 4, 8, 12 & 24) using a portable walkway with embedded pressure sensors (GAITRite®, CIR Systems Inc., NJ, USA). The student will join the team in team meetings, learn how to operate GAITRite® mat and conduct this part of the study under the supervision of study investigators. Learning study protocol, about standardized assessment of depression are part of the

experience but standardized gait assessment using GAITRite® is the core task that the student have. Also, the student will develop and maintain database for the gait parameters. Will start collecting data over the first year while learning how to operate GAITRite® and develop database

Expected Objectives/Accomplishments for Student for Year 2: student will continue to collect data but will also spend the last month performing preliminary data analysis and write up preliminary results to be presented locally, nationally or internationally. At a later stage and when the study is completed, the student will be involved in manuscript writing to be on the authorship of study articles related to this part of the study.

If REB approval is required for this project, please provide REB Number: 105915 OR provide the status of the application for REB approval: revision under review

Note: REB approval should be obtained prior to the start of Summer 2015.

Please submit complete application form, together with an abbreviated CV (not more than 4 pages – please do not include your entire CV) to Stacey Bastien at srop-srtp@schulich.uwo.ca

Deadline for submissions: Monday, December 8, 2014.

References

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