Effects of rhythmic auditory cueing on ambulation in patients with Parkinson disease

Clinical Bottom Line:
1. Rhythmic auditory cueing (RAC) has no affect on increasing stride length in patients with Parkinson Disease (PD) who experience freezing episodes.
2. Patients with PD who experience freezing episodes will decrease their walking speed when RAC is provided at frequencies slower than a patient’s self selected pace. At increased RAC frequencies, this correlation plateaus and the patient’s walking speed does not increase with faster cueing.

Citation:

Clinical Question: Does rhythmic auditory cueing increase gait speed and stride length in patients with PD who experience hypokinesia compared to individuals who do not receive auditory cueing?

The Study: The main purpose of this study was to determine whether RAC has an influence on stride length and walking speed in patients with PD, and also to see whether the effects are different for freezers vs. non-freezers. Impairments in gait speed and stride length tend to accompany the progression of PD, and can therefore lead to significant functional loss and an increase risk of falling. This study was a non-randomized repeated measures design.

Study Patients: 20 subjects were recruited (10 freezers and 10 non-freezers) by a referring neurologist. Freezers were defined as patients with freezing episodes occurring at least once a week. They were all in a stable medication phase during the time of testing each day.

Control Group: A volunteer group of 10 age-matched controls were recruited. They were given the exact same series of trials (including RAC) as both groups with PD.

Experimental Group: Subjects were instructed to walk 8 m along a walkway in a gait laboratory under 5 randomized cueing conditions. These conditions were preceded by one baseline walking condition at the patient’s self-selected speed. RAC was provided at the established baseline frequency, at an increased step frequency of 10% and 20% above baseline, and also at a decreased frequency of -10% and -20% below baseline. Each condition was performed three times, and then averaged. All subjects completed the 1-day study. This study separated freezers from non-freezers.

The Evidence: Gait parameters were using an eight camera VICON data capturing system. Stride length significantly decreased for freezers at +10%. Freezers significantly decreased their walking speed under both the -10% and -20% conditions. However, they were unable to increase their walking speed under the +10%. The freezers had more problems with the timing of walking, but made smaller errors at synchronizing their cadence to the RAC when compared to non-freezers. This implies that freezers may be more reliant on the cueing for rhythm and therefore make fewer mistakes at slower frequencies.

Comments: Small sample size is a limitation of this study along with the inability to randomize the sample. Having a control group strengthens the evidence of this study. Only obvious biases were controlled for, making the internal validity moderate. The sample was recruited from one surgeon, and recruiting subjects from multiple locations for the purpose of random selection would have allowed the evidence to be more generalized.

Appraised by: Candi Brooksby