Treadmill Regimen Ups Endurance in CP

BY SHARON WORCESTER
Southeast Bureau

BOSTON — Treadmill training appears to benefit children with cerebral palsy, according to the findings of three studies presented at the annual meeting of the American Academy for Cerebral Palsy and Developmental Medicine.

In one study—a matched pairs, clinical, controlled trial that took place in a specialized school setting—6 weeks of partial-body-weight treadmill training improved walking speed over short distances. In some children, the training also improved endurance, Karen Janine Dodd, Ph.D., reported.

A total of seven children aged 5-14 years (mean of 8 years 9 months) were recruited for the experimental group, and seven others matched for gender, age, type of cerebral palsy (CP), and Gross Motor Function Classification System (GMFCS) level served as controls. Those in the experimental group walked on the treadmill using partial-body-weight support (using a harness support apparatus under physical therapist supervision) twice weekly for a maximum of 30 minutes per session for the 6-week study period. Control patients continued normal activities, which could include therapy but not treadmill training.

COURTESY DR. AMY WINTER BODKIN

A child with cerebral palsy is doing the treadmill training program in the home.

Compared with controls, those in the experimental group showed significant improvements in walking speed, with a mean increase of 4.21 m/min (a 68% increase over baseline) in the experimental group, and no change in the control group. Results on a 10-minute walk test showed a "definite trend" that fell short of statistical significance toward improvement in the experimental group, with a mean increase of 19.81 m (57% over baseline), said Dr. Dodd of La Trobe University, Melbourne. Children in this study had GMFCS level III (4 patients) or IV (10 patients) disease, indicating a moderate to severe walking disability. Six had athetoid quadriplegia, six had spastic quadriplegia, and two had spastic diplegia.

In another study, a more intensive program of body-weight supported treadmill training improved walking speed and efficiency, and in some cases functional gait, balance, and endurance in school-age children with CP and GMFCS level 1 who were able to ambulate independently without assistive devices.

Six children aged 6-14 years participated in 30-minute treadmill training sessions twice daily, 6 days per week for 6 weeks. A harness system was used to support 30% of body weight at the start of the study, and support was decreased to almost 0% by the end of the study, Patricia Burtner, Ph.D., reported.

Pre- and post-training tests showed significant improvements on 10-m walking velocity (mean 1.47 m/sec vs. 1.66 m/sec) and on energy expenditure index (mean 0.68 vs. 0.39, calculated as ambulation heart rate minus resting heart rate divided by ambulation velocity), said Dr. Burtner of the University of New Mexico, Albuquerque. Individual results on the 10-m velocity test showed that five of six participants improved by at least 13% and as much as 23% following training, while one had a decrease of about 8%. Three of six participants had 3%-30% improvement on the 6-minute endurance walk test.

Furthermore, three of the subjects showed improvement of 50%-300% on a single-leg balance test, and four of six showed improvement of 1%-9% on a gross motor function measure score, although the overall improvements on these tests were not statistically significant.

In a third study, an 8-week, home-based treadmill training program in ambulatory children with hemiplegic CP failed to show significant improvement in a number of outcome measures, including a 6-minute walk test, gross motor function measure, and gait symmetry and endurance, but participants and/or their families reported the training was beneficial.

"It is interesting to note that seven of eight families stated that treadmill training was beneficial, and that all reported improved gait and/or function," said Amy Winter Bodkin, Ph.D., of the Center for Gait and Movement Analysis at the University of Colorado at Denver.

This randomized, controlled trial included eight children, aged 6-12 years, with GMFCS level I or II CP who trained three times per week (without body-weight support) for 20 minutes per session, and seven controls.

The findings are inconsistent with previous studies, and this may be a result of the relatively high level of ability in the study population. The participants felt the training promoted smoother gait and the ability to walk farther, Dr. Bodkin noted. Treadmill training should continue to be studied, she said. ■

Screening for ADHD in Spina Bifida Urged

BY MARY ELLEN SCHNEIDER
New York Bureau

PHILADELPHIA — Routine screening of spina bifida patients for attention-deficit hyperactivity disorder should become a standard practice for physicians, Dr. Scott W. Stuart said at the annual meeting of the Society for Developmental and Behavioral Pediatrics.

Dr. Stuart, a developmental pediatrics fellow at the Medical University of South Carolina (MUSC) in Charleston, and his colleagues performed a chart review of 151 children with spina bifida, looking for diagnoses of ADHD and of medication use.

"Children with spina bifida are at significantly higher risk for ADHD behavior and medication treatment" than are those in the general population, he said.

Previous studies of patients with spina bifida have found that they are at risk for multiple neurobehavioral deficits. And clinicians who care for this population have long suspected that there is a high prevalence of ADHD symptoms in this group of patients, Dr. Stuart said.

Dr. Stuart and his colleagues performed a chart review of all patients who received care at the MUSC spina bifida clinic between Jan. 1, 1995, and Nov. 30, 2005, to determine the prevalence of ADHD in a population of spina bifida patients and compare that with general national and state trends for ADHD prevalence.

They set strict inclusion criteria that restricted subjects to those patients who were at least 7 years old at the last documented visit and who had a diagnosis of myelomeningocele or lipomeningocele. The study excluded diagnoses of spina bifida occulta, sacral agenesis, meningocele, and sacral dimple. To be considered a positive case, the diagnosis of ADHD had to be documented in the chart and the patient had to have a past or current history of taking medications for ADHD.

Of 151 patients in the clinic, 96 met the study criteria for diagnosis and age. Of that group, 22 patients also had a history of ADHD medication use and were included as positive ADHD cases.

The researchers found that 24% of the patients at the MUSC spina bifida clinic had a diagnosis of ADHD, compared with an 8% ADHD prevalence nationwide and a 10% prevalence in South Carolina. In addition, 19% of the MUSC sample had a diagnosis of ADHD combined with current medication use. On the national level, the current use of ADHD medication is reported to be 4%; it is 6% statewide.

The researchers also found that a history of ventricular shunt and shunt revision was associated with ADHD behaviors in their sample. For example, among patients whose charts included either documented concerns about ADHD, a confirmed diagnosis, or a history of medication use, all had a history of a ventricular shunt.

The study is limited by its small size, gaps in documentation, and lack of racial diversity, Dr. Stuart said. ■