The efficacy of Adeli suit treatment in children with cerebral palsy

Commentary

Adeli suit treatment (AST) is a pertinent and timely topic for research. Many families and clinicians are interested in the outcomes of treatment using the Adeli suit, but the rehabilitation community does not have adequate scientific support for its use as a generally accepted treatment for cerebral palsy (CP). Very little research has been completed around non-traditional treatments such as AST. The study reported in this issue of DMCN by Bar-Haim et al.[1] compared the use of AST and traditional neurodevelopment treatment (NDT) in children with CP.

The prototype of the Adeli suit, initially named the Penguin suit, was created in 1971 by the Russian space program for cosmonauts to offset zero gravity conditions in space.

The AST technique uses an intensive exercise protocol paired with wearing a form-fitting garment that provides resistance to movement. The suit comprises a vest, shorts, knee pads, and specially designed shoes. Pieces of the suit are connected by hooks, rings, and elastic bands that can be adjusted to provide pressure and support to muscle groups and joints. The bungee-like cords are adjusted by therapists to mimic normal flexor and extensor patterns of major muscle groups in an attempt to reposition limbs to correct abnormal muscle alignment. The theory is that once the body is in proper alignment, aggressive movement therapy can be performed that will re-educate the brain to recognize correct movement of the muscles. Developers of the Adeli suit claim that the suit enhances communication between the brain and peripheral muscles by increasing blood flow, EMG readings, EEG function, and bone calcification, while decreasing ataxia and the intensity of dysarthria. The suit is alleged to provide a vertical load of 30 to 80lbs of pressure-giving proprioceptive input and to improve the vestibular system.[2,3]

The therapy regimen begins with stretching and massage before donning the suit and performing therapy. With the suit on, patterning exercises are performed using suspended positioning against gravity and assisted movement during functional mobility tasks, with tasks chosen based on the child's level of function.[2,3]

Suit treatment programs are lengthy; most are run 6 days per week, 5 to 6 hours per day, and last 3 to 4 weeks in duration. Current insurance providers do not cover AST, considering it investigational and experimental.[4,5] Until recently, suit therapy has not been readily available to children in the USA.[6]

The study by Bar-Haim et al. was not clear in explaining what type of activities were completed with the participants in each of the two treatment groups. It would be helpful to see a sample of therapy activities performed in order to understand the complete treatment that each group received. To truly evaluate the efficacy of the Adeli suit, it seems that the only difference between the two groups should be the suit; if both groups had received the same treatment, the actual effects of the suit alone would be evident.

Several questions are left unanswered and suggest future research before AST can be accepted as an effective treatment. In this study, AST seemed to work best for Gross Motor Function Classification System level II. What differences in outcomes existed within and across children at level II, III, and IV? Would ambulation be a better measure to assess energy cost than stair climbing, knowing that the level IV children have extreme difficulty with stairs? Besides NDT, there may be treatment strategies that are less costly and more accessible to compare the efficacy of AST. While NDT and AST training are costly for therapists, AST requires additional expenses for the family in travel, program costs, and time spent away from home. The results of the Bar-Haim et al. article report statistical significance in both treatment groups at different points in the trial, but are the statistical differences clinically important?[7]

Families who have children with moderate to severe disabilities are at risk of spending valuable resources on alternative therapies which have not been proven, and professionals should be cautious in encouraging families to pursue alternative techniques in the early phases of research on their efficacy. While it is important to continue research on alternative therapies, the Bar-Haim et al. study does not provide adequate support for the routine use of AST for children with CP.

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