The application of Kinesio Taping in children with cerebral palsy

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The first studies about the use of taping to improve motor functions in children needing neurorehabilitation were published 8 years ago and reported conflicting results. In a study of improving outcomes of physical therapy, Footer et al. did not find any significant improvement in seated postural control in children with quadriplegic cerebral palsy (CP) when therapeutic taping was applied for 12 weeks to a group assigned to physical therapy alone.[1] Conversely, Yasukawa et al. reported positive results in an uncontrolled trial of neuromuscular taping (Kinesio Taping) on the upper limb in a heterogeneous group of children with neurological disorders.[2] The few published studies that followed seemed to confirm the positive benefits of Kinesio Taping used as an adjunct to neurorehabilitation, but most of them were not randomized controlled trials and involved small samples of participants. The difficulties in investigating this topic, beyond those related to the involvement of children, are probably related to the intrinsic variability of this technique. From a clinical point of view, Kinesio Taping can be tailored to the specific needs of each single child; on the other hand this adaptability implies a lack of repeatability that could introduce a potential bias from a scientific point of view.

For these reasons, the recent study of Kara et al.[3] could be an important milestone in the application of taping in the field of child neurorehabilitation. To my knowledge it is the first randomized controlled trial investigating the effects of Kinesio Taping application on physical fitness, gross and fine motor capacity, and functional independence in daily living activities on an adequate number of children with unilateral CP. The authors found significant improvements in the above domains in the group where taping was added to usual care for 12 weeks, with the control group receiving only usual care for the same amount of time.

Reading these results in conjunction with those of Costa et al.,[4] and with the negative ones obtained by Footer et al.,[1] Kinesio Taping technique seems to be more effective in children at levels I to II of the Gross Motor Function Classification System and in carrying out dynamic activities with respect to the static ones. Concerning the former point, taping could drive children to exploit their few available resources, but would prove ineffective in severe cases. Concerning the latter point, it has been suggested that the findings were due to the fact that dynamic activities require greater demand on postural control than static ones.[4] Another reason could be that the micro-oscillations related to postural control in static activities might not be sufficient to stress the strips of taping, inducing an elastic reaction that could significantly activate cutaneous mechanoreceptors enhancing sensory feedback.

Sensory feedback and proprioception have a key role in the development of proper motor schemas. When we applied functional taping on the ankle of children with unilateral CP, the only child not showing any improvement was the one affected by dyspraxia with sensory integration dysfunction.[5]

In a recent study, Kinesio Taping was applied with the aim of decreasing spasticity and muscle hypertone by means of enhancing sensory inputs.[6] Despite proprioception, improvement was not directly measured. The authors interpreted their electromyographic data to suggest that the application of Kinesio Taping might increase skin receptor output, stimulating supraspinal centers, and thus enhancing kinesthetic and joint position sense.

I am usually sceptical when a single technique has been reported to be useful for different pathologies and in improving various aspects of motor control. However, as demonstrated by the randomized controlled trial of Kara et al.,[3] Kinesio Taping applied to children with mild or moderate CP, enhancing sensory feedback and in turn proprioception, can be a facilitator for the neurorehabilitation-driven development of proper motor control.

REFERENCES

1. Footer CB. The effects of therapeutic taping on gross motor function in children with cerebral palsy. *Pediatr Phys Ther* 2006; **18**: 245–52.
2. Yasukawa A, Patel P, Sisung C. Pilot study: investigating the effects of kinesio taping in an acute pediatric rehabilitation setting. *Am J Occup Ther* 2006; **60**: 104–10.
3. Kara OK, Uysal SA, Turker D, Karayazgan S, Gunel MK, Baltac G. The effects of Kinesio Taping on body functions and activity in unilateral spastic cerebral palsy: a single-blind randomized controlled trial. *Dev Med Child Neurol* 2014; doi:10.1111/dmcn.12583.
4. da Costa CS, Rodrigues FS, Lela FM, Rocha NA. Pilot study: investigating the effects of Kinesio Taping® on functional activities in children with cerebral palsy. *Dev Neurorehabil* 2013; **16**: 121–8.
5. Iosa M, Morelli D, Nanni MV, et al. Functional taping: a promising technique for children with cerebral palsy. *Dev Med Child Neurol* 2010; **52**: 587–9.
6. Tamburella F, Scivoletto G, Molinari M. Somatosensory inputs by application of Kinesio Taping: effects on spasticity, balance, and gait in chronic spinal cord injury. *Front Hum Neurosci* 2014; **8**: 367.

