Service Priorities and Programmes

Electronic Presentations

Convention ID: 367
Submitting author: Ms Nar Chi, Nerita CHAN
Post title: Senior Physiotherapist, Tuen Mun Hospital, NTWC

A Six-Year Review on the Effect of Selective Dorsal Rhizotomy for Children with Cerebral Palsy

Chan NC(1), Lao LM(1), Yam KY(2), Law HY (2), Fong TS(2), Poon YHP (1)
(1)Department of Physiotherapy, Tuen Mun Hospital (2)Department of Neurosurgery, Tuen Mun Hospital

Keywords:
Physiotherapy
cerebral palsy
selective dorsal rhizotomy
gait analysis

Introduction

Children with Cerebral Palsy (CP) often encountered different form of movement disorders. Selective Dorsal Rhizotomy (SDR) is an effective procedure in reducing the spasticity and helping to improve their gait pattern. Majority of the SDR for children with CP in Hong Kong were performed at NTWC.

Objectives

The aim of the present study is to analyse the long term changes in gait pattern after SDR for children with Gross Motor Function Classification System (GMFCS) level I and II.

Methodology

Children with CP selected for SDR with GMFCS level I and II would undergone 3-D gait analysis and energy consumption test before surgery, at one year and six years post-operation. The lower limb kinematics data including the pelvic tilting (PT), the maximum hip extension (MHE), maximum knee extension (MKE) in stance, knee extension in initial contact (KEIC), ankle dorsiflexion in stance (ADF) were analyzed. Kinetics data on ankle moment quotient (AMQ) and ankle power quotients (APQ) were also selected for analysis. Repeated Measure ANOVA were used to compare the time effect over 6 years and the between groups difference of GMFCS level I and II.

Result

Thirteen patients (7 in GMFCS I and 6 in GMFCS II), mean age 7.3±1.3 years old, had completed the six-year gait analysis. For the kinematics, the PT were significantly increased in both groups over time ($p= 0.034$ for GMFCS I and $p=0.001$ for GMFCS II). Both groups showed significant decrease in the range of MHE over the 6 years but the change was not significant when compared the 1 year and 6 year result ($p=0.218$ and $p=0.073$ respectively). For KEIC and ADF, there was no interaction between the two groups, both groups showed significant improvement over time ($P=0.002$). The

improvement could be maintained at 6-year post-operation (p=0.012 for KEIC, p=0.004 for ADF). Overall, patients were able to walk with a more straight posture. For kinetics, the group of GMFCS I showed significant improvement on AMQ and APQ over time (p=0.01 and p=0.03 respectively), whereas the group of GMFCS II showed no significant difference over time on AMQ (p=0.224). The results indicated that the group of GMFCS I showed better improvement over ankle moment and power after the SDR surgery. Both groups showed improvement in energy consumption in 1 year post-op, however, the changes over time was not significant statistically (p=0.247). Conclusion: The effect of SDR procedure is able to improve the kinematics and kinetics of gait with more upright pattern in sagittal plane and the improvement can be maintained at 6-year post-operation in both groups of GMFCS I and II. Therefore, the procedure may also be helpful for those CP with high functional level like GMFCS I even though this was not always a recommended group to receive SDR surgery in other previous studies.