

# P171 - PREVALENCE AND RISK FACTORS OF LOW BACK PAIN AMONG CAREGIVERS OF CHILDREN WITH CEREBRAL PALSY POST SINGLE EVENT MULTILEVEL SURGERY

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**Introduction:** Cerebral palsy (CP) is a non-progressive disorder affecting the individuals posture, movement, causing limitation in the activities which is permanent, caused due to insult in developing brain of neonates or infants. CP causes not only motor disturbances but also sensory, cognitive, social, behavior, speech and communication, seizure disorder, respiratory illness and other musculoskeletal disorder. Children with CP have impairment which has effect on limitation of activity and participation. These children require assistance for their personal needs like bathing and feeding from their caregivers. Caregivers are responsible for most of the daily care of the child and the level of dependence of the child depends on the severity of CP. This dependence is increased especially after single event multilevel surgery (SEMLS) which is an effective rehabilitation strategy for children with CP. Also, during the postoperative period, caregivers are required to transfer the child from bed to wheel chair, carry the child to the rehabilitation centre, on the staircase and at home till he/she was able to walk independently. During this period, the caregivers have little time for themselves to satisfy their own social needs, and this increases the feeling of burden and tension, besides having a significant impact on finance, emotions, well-being, marital relations and overall addition to physical stress.

**Aim:** To identify the prevalence and risk factors of low back pain among the caregivers of children with CP following SEMLS.

**Materials and Methodology: Study design:** Longitudinal survey. **Subjects:** 284 caregivers of children with cerebral palsy post SEMLS with mean age: 38.5± 5.44 years. **Study setting:** The study was conducted in a tertiary level rehabilitation hospital over a period of 7 years (2008-2015). **Inclusion criteria:** Caregivers of children with CP post SEMLS. **Exclusion criteria:** Caregivers who had prior musculoskeletal problems were excluded from the study. **Outcome measure:** A self-administered questionnaire was used to collect the relevant data. Modified Caregiver Strain Index (CSI) was used to measure the level of physical exertion during lifting or carrying the child and fatigue was measured using the Borg CR-10 scale. **Modified caregiver strain index:** The Modified Caregiver Strain Index (CSI) is a tool that screen for caregiver strain for any age. CSI has 13 questions that are related to provision of care under the following major domains: Employment, Financial, Physical, Social, and Time. The Modified Caregiver Strain Index is a version of the Caregiver Strain Index developed in 1983. Scoring is 2 points for each 'yes', and 1 point for each 'sometimes' response.

The higher the score, the higher the level of caregiver strain. Many studies have proved its high validity and reliability. **Borg CR-10 scale:** Borg CR-10 has been used to assess the perception of physical exertion during resistance exercise. It uses a modified 0-10 category ratio. After completing each working set, the subjects were asked to rate their perceived exertion on the CR-10 scale by choosing any number on the scale to rate their overall effort during the resistance exercise. Score of 0 implies no effort (rest) and maximum score of 10 implies maximal effort (most stressful exercise). The Borg CR-10 scale has been used to quantify the perception of physical exertion. Many studies have validated the CR-10 scale for measurement of the intensity of resistance exercise.

**Results:** In our study, the majority of caregivers were females (68.4%). Children with CP were of mean age of 12.5± 5 years and most of them had a high severity level of CP (GMFCS 4 or 5) before the start of rehabilitation immediately after SEMLS. This potentially acted as a confounder to the caregivers' physical health as more effort was required from the caregiver's side. Most of the children weighed more than 25 kg, which was beyond the safe lifting load recommended for female caregivers. Most of the caregivers held their child in an upright position, directly against the chest in the centre. Lower back pain was the commonest reported musculoskeletal symptom (58%) followed by knee pain and shoulder pain. More than 90% of low back pain was found to be of myofascial origin and the remainder due to disc degeneration. Low back pain and increased fatigue levels as recorded by Borg CR-10 scale was commonly observed among caregivers during the non-ambulatory phase of the post-operative rehabilitation of their children. More than 60% of the caregivers reported a high level of stress with scores of more than 7 in the CSI. Caregivers of children with older age, more severe disabilities (GMFCS IV and V), uncooperativeness and higher body mass index were at higher risk of developing low back pain.

**Conclusion:** The results indicated a significant prevalence of low back pain among caregivers of children with CP. Early identification of the cause of pain and appropriate treatment of the same is essential to prevent them from becoming severe cases and hampering the child's rehabilitation. Training caregivers on safe lifting and carrying techniques is recommended.

**Keywords:** Low back pain, caregivers, cerebral palsy, single event multilevel surgery

#### References:

1. Davis E., Shelly A., Waters E., Boyd R., Cook K., Davern M.. The impact of caring for a child with cerebral palsy: quality of life for mothers and fathers. *Child Care Health Dev.* 2010;36(1):63-73
2. National Alliance for Caregiving. Caregivers of Children: A Focused Look at Those Caring for A Child with Special Needs Under the Age of 18: 2009. Accessed: 7 March 2013. [[http://www.caregiving.org/data/Report\\_Caregivers\\_of\\_Children\\_11-12-09.pdf](http://www.caregiving.org/data/Report_Caregivers_of_Children_11-12-09.pdf)]
3. Kuo D.Z., Cohen E., Agrawal R., Berry J.G., Casey P.H. A National Profile of Caregiver Challenges Among More Medically Complex Children with Special Health Care Needs. *Arch Pediatr Adolesc Med* 2011; 165(11): 1020-1026
4. American Psychological Association. What Do Family Caregivers Do? 2009. Accessed: 7 March 2013. [<http://www.apa.org/pi/publications/caregivers/faq/family.aspx>].
5. Issue Number 14, Revised 2007 Series Editor: Marie Boltz, PhD, GNP-BC Series Co-Editor: Sherry A. Greenberg, MSN, GNP-BC New York University College of Nursing The Modified Caregiver Strain Index (CSI) By M. Terry Sullivan, RN, MSW, MSN, CMC, Connecticut Community Care, Inc
6. Buckley J.P., Borg G.A. (2011) Borg's scales in strength training; from theory to practice in young and older adults. *Appl Physiol Nutr Metab* 36: 682-692
7. Pincivero D.M., Coelho A.J., Campy R.M., Salfetnikov Y., Bright A. (2002) The effects of voluntary contraction effort on quadriceps femoris electromyogram median frequency in humans: a muscle and sex comparison. *Eur J Appl Physiol* 87: 448-455
8. Day M.L., McGuigan M.R., Brice G., Foster C. (2004) Monitoring exercise intensity during resistance training using the session RPE scale. *J Strength Cond Res* 18: 353-358
9. Li K.W., Yu R. (2011) Assessment of grip force and subjective hand force exertion under handedness and postural conditions. *Appl Ergon* 42: 929-933
10. McGorry R.W., Lin J.H., Dempsey P.G., Casey J.S. (2010) Accuracy of the Borg CR10 scale for estimating grip forces associated with hand tool tasks. *J Occup Environ Hyg* 7: 298-306
11. Pincivero D.M., Coelho A.J., Campy R.M. (2003) Perceived exertion and maximal quadriceps femoris muscle strength during dynamic knee extension exercise in young adult males and females. *Eur J Appl Physiol* 89: 150-156
12. Pincivero D.M., Coelho A.J., Campy R.M. (2004) Gender differences in perceived exertion during fatiguing knee extensions. *Med Sci Sports Exerc* 36: 109-117
13. Pincivero D.M., Coelho A.J., Campy R.M., Salfetnikov Y., Bright A. (2001) The effects of voluntary contraction intensity and gender on perceived exertion during isokinetic quadriceps exercise. *Eur J Appl Physiol* 84: 221-226

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14. Pincivero D.M., Coelho A.J., Erikson W.H. (2000) Perceived exertion during isometric quadriceps contraction. A comparison between men and women. *J Sports Med Phys Fitness* 40: 319-326
15. Andersen L.L., Andersen C.H., Mortensen O.S., Poulsen O.M., Bjørnlund I.B., et al. (2010) Muscle activation and perceived loading during rehabilitation exercises: comparison of dumbbells and elastic resistance. *Phys Ther* 90: 538-549
16. Hackett D.A., Johnson N.A., Halaki M., Chow C.M. (2012) A novel scale to assess resistance-exercise effort. *J Sports Sci* 30: 1405-1413
17. Sweet T.W., Foster C., McGuigan M.R., Brice G. (2004) Quantitation of resistance training using the session rating of perceived exertion method. *J Strength Cond Res* 18: 796-802