

Contribution of risk factors in therapeutic contoured seating device users with severe disability

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Objective: The severely disabled children are suffered from a lot of musculoskeletal deformities. A large number of the severely disabled children use the custom molded fitting chair that is manufactured for their specific body shape. A lot of risk factors contribute musculoskeletal deformities, and the therapeutic seating device would be recommended according to the degree of deformities. The author planned this study to define the degree of contribution of various risk factors in the prescription of the therapeutic contoured seating device.

Method: Thirty two subjects (17 males and 15 females) with severely disability were enrolled. Mean age of the subjects was 6.4 years (age range 2-17 years). Twenty two patients were CP, and 10 patients were not. Patients with non-cerebral palsy were spinal muscular atrophy, progressive muscular dystrophy, Dandy Walker syndrome, meningomyelocele, congenital metabolic disease, and so on.

The author evaluated several indices such as sitting ability scale (7 points), modified Ashworth scale (MAS), GMFCS, upper & lower extremity motor strengths, limited range of motion, their milestones, persistence of primitive reflexes, respiratory difficulty, dysphagia, cognitive dysfunction, language delay, asymmetry of head, neck, scapula, upper extremity, trunk, pelvis, lower extremity. Also the author evaluated musculoskeletal indices such as Cobb's angle, hip migration index, Femur neck to shaft angle, pelvic obliquity, and windswept deformity. Finally the author classified the degree of contribution of each risk factor.

Results: All subjects has the problem of sitting abilities. Twenty six subjects among them were unplaceable. And all subjects were GMFCS V. MAS included various grades, such as 6 in grade 0, 5 in grade 1, 7 in grade 2, 10 in grade 3, and 5 in grade 4. Manual muscle strengths of upper & lower

extremity showed trace to fair grades. Limited range of motion of joints showed markedly larger in lower extremity than upper extremity. Developmental milestone showed a lot of levels, and inability of head control was the most common (17/32). Most of them (31/32) had cognitive and language impairment. Asymmetry of head, neck, scapula, upper extremity, trunk, pelvis, and lower extremity were about half of subjects. Respiratory difficulty showed in 25%, and dysphagia in 50% of subjects. There was some degree of scoliosis in 21 patients, but the severity was variable. Hip subluxation or dislocation showed in 12 subjects of them. Whereas, most of them (28/32) had coxa valga. Finally pelvic obliquity showed in 12 subjects, and windswept deformity only 6.

Conclusion: The most important risk factor in therapeutic contoured seating chair users were sitting inability, GMFCS V, coxa valga. Muscle tone, manual muscle test, joint contracture, developmental milestone, asymmetry of posture, scoliosis and hip dysplasia were another contributors, but the proportion of contribution was relatively weak. This study recommends that sitting ability, GMFCS, hip & spine x-ray work up could be needed for the precise prescription of therapeutic contoured seating chair.