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PHAKKA RATHA WIS- A- WIS TRICYCLE AN EFFECTIVE PHYSIOTHERAPY TOOL.

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Abstract: Tricycling strengthen the musculature of hips, knees and ankles, while also improving cardiopulmonary fitness in the children with severe physical disabilities. *Phakka Ratha* mentioned in the *Kashyapa Samhitha Phakka Chikithsa Adhyaya* can be correlated to tricycles. In *Phakka Chikithsa Acharya* clearly mentioned the implementation of *Tricakra Ratha* in conditions such as *Pramlapanamadhakayam, Nishchesthaadhakayam, Pani Janugamam*. Current researches supports the benefits of riding an adaptive tricycle for children with cerebral palsy, hypotonia,scoliosis. Bimanual tricycle training in these conditions improve the locomotion indurance, gross motor functions and muscular activities. Current studies based on the age group of 2-4 years with an intervention period of 8 weeks reveals ROM, GMFM -66 & Peabody score improved after the eight weeks. In the light of the evaluation of the studies conducted already; there is still scope for further more studies

Key words: *Phakka Ratha*, Tricycle, cerebral palsy, scoliosis.

INTRODUCTION

Tricycling is a rehabilitation tool used by physical therapists. Tricycling strengthen the musculatures of hip, knees and ankles. While also improving the cardiopulmonary fitness in the individual. Childrens diagnosed with cerebral palsy and scoliosis typically present with motor impairements, postural control and coordination that can drastically affect their quality of life. Tricycling may promote motor coordination, independence and self esteem in these cases of cerebral palsy and scoliosis. *Phakka Ratha* mentioned in the *Kashyapa samhitha; Phakka Chikithsa Adhyaya* can be considered to tricycles.

LITERARY REVIEW

Lower extremity cycling is a rehabilitation tool used by physical therapists to improve strength and cardio – respiratory fitness and appears well suited as a therapeutic intervention for children with cerebral palsy and scoliosis. Simultaneous strengthening of hip, knee and ankle musculature may be achieved without the need to perform isolated joint movement out of the basic flexion and extension movement synergies. In contrast to aerobic exercises that require walking, running,cycling is less dependent on balance, coordination and motor control. Cycling may induce positive speed related changes in neuromotor control and muscle physiology by promoting higher speeds of movement than are possible during daily activities of most children with cerebral palsy and scoliosis[1].

Benefits of Tricycling:

- Cycling strengthen the muscles of hip, knees and ankles.
- Improves coordination.
- Postural control.
- Gross motor function
- Cardiovascular fitness.
- Visual cortical improvement.

Based on the research article "The Benefits of Riding an Adaptive Tricycle For Toddlers with Cerebral Palsy"conducted among the chidren with cerebral palsy of age group 2-4years of old with an Intervention period of 8 weeks; Duration of Tricycling for about 30 minutes for a minimum of three times a week[2]. This research shows that when compared to the normalization of movement method common to physical therapy, functional intervention demonstrates higher scores of outcome measures such as Gross Motor Function Measure showed that constraint - induced movement therapy improved motor impairments and functions.

Outcomes measurements are :

 Tone increased bilaterally in the muscle groups of shoulder extensor, elbow flexors, knee flexors and ankle plantar flexors.

	B/F	
A/F		
Left popliteal angle degree	60 degree	70
Right popliteal angle	50	65
Left & Right ankle degree	-10	5

Dorsiflexion

- Muscle tone increased :- left shoulder flexor, wrist flexor, knee extensor, ankle plantar flexors.
- Bilaterally muscle tone increased:- elbow flexors, elbow extensors, finger flexors.
- Left popliteal angle: 55 degree to 65 degree.
- Left dorsiflexion: 13 degree to 18 degree.
- GMFM -66 (Lying and rolling) from a 27% to a37%
- Head support & emotional status increased.
- Right ankle plantar flexor tone 2 to a 1+
- Wrist extensor improved from a 1+ to a 0
- Pronators improved from a2 to a1+
- Visual motor task improved
- Grith left quadriceps increased by one inch
- GMFM -66 (59% to 85% within 6 weeks) and 89% by 8 weeks
- 25% reduced assistance.
- Fine and gross motor increased.
- Bimanual tasks such reciprocal gait, stair negotiation as well as knee high barrier were improved.
- Improvements in transitioning objects from the Rt and Lt hand increased fluidity & limited hesitation.

By the help of tricycling children with cerebral palsy walk 20 feet independently on a flat and asphalt surface.

Fig: 1 to 5 (Transformation from Phakka Ratha toTricycles)

Phakka Ratha mentioned in the *Kashyapa Samhitha ; Phakka Chikithsa Adhyaya* can be considered to tricycles. In this context clearly mentioned that a three wheeled chariot made by wise carpenter is known as *Phakka Ratha*. Holding it gently the child suffering from *Pramlapanamadhakayam, Nishchesthaadhakayam, Pani Janugamam*[3].

DISCUSSION

Tricycling demonstrated a positive co-orelation between speed and coordination. Emphasizing the use of extremity allows the child to utilize both extremities in order to improve the quality of movement. Here, *Acharya's Phakka Ratha* proved to be the forerunner of the present tricycle.

CONCLUSION

Tricycling is considered as relatively safe intervention, because there is little dependence on balance coordination & motor control which decreases injury and fall risk. Tricycle induce positive speed related changes in neuromotor control & muscle physiology. Here, *Acharya's Phakka Ratha* is proved to be the forerunner of the present tricycle.

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