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A COMPARATIVE STUDY ON SURGICAL VERSUS PONSETI APPROACH FOR THE MANAGEMENT OF CTEV

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ABSTRACT

As an alternative to surgical management, the Ponseti technique has increasingly become the method of choice for the treatment of Congenital TalipesEquinovarus (CTEV). According to previous studies, the Ponseti technique reduces the need for intensive corrective surgery.Peak pressure, maximum force, pressure time integral, and force time integral are typical outcome measures recorded for the overall foot print or particular areas of the foot in pedobarographic research. Bowen described the most popular technique for foot segmentation in 1998, and it has since been used by many writers.The aim of this research was to see if there were any pedobarographic variations between children with CTEV who were treated with the Ponseti technique and those who were treated with a more conventional orthopaedic approach. There was also a comparison of these two groups with a traditionally established cohort.Plantar pressure analysis is an objective outcome assessment of the foot's dynamic loading that can be used in conjunction with other clinical and radiological findings to provide additional information about the biomechanics and structure of the foot in children with CTEV. To evaluate pedobarographic outcomes in people with CTEV, further research is needed to establish and validate different segmentation and analysis techniques. Changes in factors such as body weight, mobility, range of motion, and pain can have an effect on their pressure patterns as they grow older, so a follow-up assessment in this population when they attain skeletal maturity is recommended

Key words: Ponseti, Congenital Talipes Equinovarus CTEV, Surgery, Congenital.

INTRODUCTION

As an alternative to surgical management, the Ponseti technique has increasingly become the method of choice for the treatment of Congenital TalipesEquinovarus (CTEV) [1]. According to previous studies, the Ponseti technique reduces the need for intensive corrective surgery [2].Peak pressure, maximum force, pressure time integral, and force time integral are typical outcome measures recorded for the overall foot print or particular areas of the foot in pedobarographic research [3]. Bowen described the most popular technique for foot segmentation in 1998, and it has since been used by many writers [4]. This method entails rotating the pedobarograph footprint so the long axis of the foot's projection is vertically aligned [5]. The hind-foot, lateral mid-foot, medial mid-foot, lateral fore-foot, and medial fore-foot are the five regions of the foot [6]. Herd (2008) created a more recent objective measurement method that included three peak pressure ratios: medial/lateral, heel/forefoot, and heel/lateral arch [7, 8].At a regional orthopaedic clinic, the Ponseti technique was introduced in 2001 for the management of idiopathic congenital talipesequinovarus (CTEV), which consists of gentle, weekly manipulation of the infant club foot, accompanied by casting and, where possible, an Achilles tenotomy [9, 10].

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Previously, club foot was treated with 6 months of serial casting, followed by 1 year of surgery that included capsulotomy of the ankle and subtalar joints, as well as the talo-navicular and calcaneo-cuboid joints, as well as lengthening of the Achilles tendon, tibialis posterior, and long toe flexors [11-12].

Aims & objective:

The aim of this research was to see if there were any pedobarographic variations between children with CTEV who were treated with the Ponseti technique and those who were treated with a more conventional orthopaedic approach. There was also a comparison of these two groups with a traditionally established cohort.

Methods & materials:

A sample size of 20 children, 10 per category, was chosen for this analysis. A chart scan was used to locate children with idiopathic CTEV who were treated with serial casting and surgery between 2001 and 2005, and those who were treated with the Ponseti technique between 2001 and 2005. To account for the lack of consent, 20 children were selected, 10 in each group, and invited to participate via mail. Regardless of subsequent intervention, all children who began in the Ponsetiprogramme were considered part of it. 10 children without disability were also recruited as a control group from among friends or relatives. Parents and children gave their informed consent. All of the participants were subjected to a physical test as well as a three-dimensional gait study. A senior physiotherapist and bioengineer collected all of the data.

Results & discussion:

The invitation was accepted by ten surgical patients and ten Ponseti patients. One of the children in the Ponseti group had an underlying neurological disorder and was removed from the study, leaving ten children in the group.

Table 1 shows the profiles of the participants. In the surgical party, eight out of ten feet (80%) needed secondary surgery, resulting in eight corrective procedures. The initial success rate for the Ponseti community was 7 of 8 (87.5%) feet, with one patient failing to correct both feet. Because of the seriousness of the deformity, this was necessary. This one-year-old patient underwent bilateral posteromedial releases and cuboid osteotomies. Achilles tenotomy was performed on 6 of the 8 (75%) feet.

The Ponseti group had a higher rate of back-kneeing than the other groups (Table 2). The CTEV had a higher rate of foot drop than the control groups. About half of the surgical patients had calcaneus, which was normally followed by a long stance period.

Both CTEV groups had substantially less outward foot progression than the control group (P 0.001). Although the foot progression angle was not substantially different between the two CTEV groups, the Ponseti group's mean foot progression angle was external, while the surgical group's was internal. Both CTEV groups had significantly higher mean external hip rotation angles than the control group (P0.001), and the surgical group had significantly higher mean external hip rotation angles than the Ponseti group (P0.05). There was a clear association between the bimalleolar axis (tibial torsion) and the foot progression angle in both CTEV groups, but not in the control group (Table 3).

Table 1: Patient's Demographics

	Control group n= 20	**Surgical group n = 10**	**Ponseti Group n = 10**
Male/female	12/8	6/4	5/5
Mean age (range)	7.9 (5.5-10.5)	9.0 (7.1-10.4)	6.7 (5.5-8.0)
Club feet: unilateral	Not applicable	7(70%)	8(80%)
Club feet: bilateral	Not applicable	3 (30%)	2 (20%)
Club feet: total	Not applicable	22	26

Table 2: Incidence (%) of visually assessed kinematic variables (by Limb)

Kinematic variable	**Control group N = 20**	**Surgical Group N= 10**	**Ponseti Group N = 10**
Hyperextension knee	13 (65%)	7 (70%)	8 (80%)
Foot drop	1 (5%)	5 (50%)	4 (40%)
Equinus	0	0	0
Calcaneus	4 (20%)	22%	26%
Prolonged stance time	8%	18%	16%

Table 3: Person Correlation For The Relationship Between Tibial Torsion (Bimalleolar Axis) And Foot Progession Angle (By Limb)

	Person correlation	P
Control (n=20)	-0.033	Not significant
Surgical (n= 10)	0.400	P<0.04
Ponseti (n = 10)	0.450	P<0.01

CONCLUSION

Despite the fact that many of the variables studied in this study demonstrated no difference between the two treatment groups and could therefore be considered an integral part of the pathology rather than a result of treatment, children in the Ponseti group experienced significantly less surgery and tend to have a better clinical outcome.

Plantar pressure analysis is an objective outcome assessment of the foot's dynamic loading that can be used in conjunction with other clinical and radiological findings to provide additional information about the biomechanics and structure of the foot in children with CTEV. To evaluate pedobarographic outcomes in people with CTEV, further research is needed to establish and validate different segmentation and analysis techniques. Changes in factors such as body weight, mobility, range of motion, and pain can have an effect on their pressure patterns as they grow older, so a follow-up assessment in this population when they attain skeletal maturity is recommended.

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