ORIGINAL ARTICLE

Comparison of Accelerated VS Standard Ponseti Method in Management of Idiopathic Clubfoot

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Abstract

Objective: To compare the efficacy of accelerated Ponseti vs standard Ponseti method for treatment of idiopathic clubfoot as assessed by Pirani scoring system.

Study design: Randomized controlled trial.

Method: A total of 80 patients, 40 in each group were randomly allocated to either Group A (Standard Ponseti) or Group B(Accelerated Ponseti). Group A underwent serial manipulations and castings weekly and Group B received manipulations and castings twice weekly. Pirani scoring was documented at presentation, at each cast and at the time of removal of final cast to assess the success of treatment in terms of Pirani score ≤ 1.

Results: 61.3% babies were male. Mean number of casts required was 5.2 in group A and 5.12 in group B. Correction of all deformities was achieved in 95% patients in group A and 90% of patients in group B. This difference was not found to be statistically significant (p=0.396).

Conclusion: Accelerated Ponseti method is a good alternative for CTEV requiring shorter time period and with comparable efficacy to standard method.

Key words: CTEV, clubfoot, congenital deformity

Introduction

The current standard of care consists of weekly manipulations and casting by Ponseti technique with successful correction of idiopathic clubfoot deformity in 98% of children reducing need for surgery[1,2]. Many of these cases are untreated or poorly treated, resulting in painful and deformed feet[3]. Therefore if left untreated, clubfoot affects an individual's mobility and threatens his or her potential productivity[4].

A common problem to any treatment regimen is compliance with the treatment protocols. Long distance travel and staying away from home and work make it difficult for families belonging to low economic class to attend foot clinics, a problem also found in other developing countries[5]. In addition, keeping a plaster clean and dry for one week can be challenging especially for parents with limited literacy. This study thus aims to determine effectiveness of a shorter duration of treatment so that most effective and economical strategies may be adopted in management of these patients.

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Objective

To compare the efficacy of accelerated Ponseti vs. standard Ponseti method for treatment of idiopathic clubfoot as assessed by Pirani scoring system.

Material and Methods

Non-probability consecutive sampling was done. Patients were assigned to either Group A (Standard Ponseti) or Group B (Accelerated Ponseti) using lottery method.

All babies of either gender from birth till two years of age with Idiopathic clubfeet including those treated conservatively before with Pirani score >1 value included.

Children older than 2 years of age, Syndromic clubfeet, secondary clubfeet and previously operated patients were not included in trial.

Study was commenced after approval from ethical committee of hospital. Written informed consent of parents was taken as a prerequisite for enrolling their children in this trial. Patients were treated as an outpatient by the author. Pirani scoring was done for every clubfoot entering in trial. Patients in Group A underwent serial manipulations and casting weekly and patients in Group B received manipulations and casting twice weekly. Repeat scoring was done on each cast change and after removal of final cast at 3 weeks

from the time of application of last cast. In first cast cavus deformity was addressed. In subsequent manipulations/castings forefoot adduction deformity was corrected and lastly the equinus deformity, if present, was addressed by Achilles tenotomy in both groups. Final cast was applied for three weeks with the foot in 10-15 degrees dorsiflexion and 70 degrees external rotation in all patients. The final Pirani score was documented at the time of removal of final cast to assess the success of treatment in terms of Pirani score ≤ 1.

Foot abduction orthosis was applied to both feet with 15 degrees dorsiflexion and 70 degrees external rotation at the end of treatment to be used for 23 hours a day for 3 months, and then only at night and nap time for 4 years to prevent recurrence.

Chi square test was used to compare efficacy in accelerated and standard ponseti groups. P value <0.05 was considered significant.

Results

A total of 80 patients (123 clubfeet) were included in study. 61.3% babies were male. Mean age of children was 5.09 months (mean ± SD=4.43) in group A and 4.57 months (mean ± SD =3.60) in group B. Mean number of casts required was 5.2 (mean ± SD = 1.62) in group A (standard Ponseti) and 5.12 (mean ± SD = 1.53) in group B(accelerated Ponseti). Achilles tenotomy was required in 71.2% patients. Correction of all deformities was achieved in 95% patients in-group A similar to study by Kampa et al[6] and 90% of patients in group B. Although standard Ponseti appears to be somewhat more effective in absolute numbers, this difference is not statistically significant (p=0.396).

At presentation mean Pirani score was found to be 4.14 (Mean ± SD = 1.17) for left foot and 4.10 (Mean ± SD = .96) for right foot in standard ponseti group and 4.48 (Mean ± SD = .91) for left foot and 4.17 (Mean ± SD = 1.01) for right foot in accelerated ponseti group.

Frequency Tables

Descriptive Statistics			
	N	Mean	Std. Deviation
Age Standard Ponseti	40	5.0957	4.43671
Age Accelerated Ponseti	40	4.5758	3.60378
Initial Lt foot Pirani St Ponseti	31	4.1452	1.17042
Initial Rt foot Pirani St ponseti	30	4.1000	.96847
Initial Lt foot Pirani Ac Ponseti	34	4.4853	.91689
Initial Rt foot Pirani Ac Ponseti	28	4.1786	1.01118
Total Cast Standard ponseti	40	5.2000	1.62038
Total Cast Accelerated ponseti	40	5.1250	1.53902
Valid N (listwise)	0		

Efficacy in terms of Final Pirani Score <= 1 * Group assigned Cross tabulation				
Count				
		Group assigned		
		Standard Ponseti	Accelerated Ponseti	Total
Efficacy in terms of Final Pirani Score <= 1	Yes	38	36	74
	No	2	4	6
Total		40	40	80

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.721	1	.396
N of Valid Cases	80		

Discussion

There are two phases of Ponseti method, the treatment and maintenance phase. The treatment phase consists of correction of deformity using plaster casts and maintenance phase uses bracing regimen to maintain corrected position of foot. The author's aim was to evaluate the efficacy of the treatment phase of this technique in accelerated mode, as has been described in literature recently[7,8] in comparison with weekly plaster changes in terms of achieving correction of clubfoot deformity.

Maintenance of corrected clubfoot in a foot abduction brace is a different part of treatment protocol, which was not part of this study.

The age of babies ranged from one day to 1.5 years, this range was similar to a study by Willis et al.[9] in which the range was from 1 to 52 weeks. A few babies did present late but this is largely attributable to illiteracy and lack of awareness of treatment options.

53.8% of babies enrolled in this trial had bilateral deformity. In a study by Gupta et al. 60% had bilateral clubfeet[10]. Right foot found to be slightly more frequently involved (23.8%) than left foot (22.5%) in patients with unilateral CTEV. Mean number of casts required in our study was 5.2 and 5.12 in-group A and B respectively which was quite similar to reported requirement of casts in literature[11]. The number of casts required does increase in patients presenting late, with prior attempts at treatment and also in patients with atypical clubfoot. The number of casts required may also increase if plaster is removed for more than a few hours before application of next cast as demonstrated in a study by Terrazas-Lafargue and Morcuende[12]. For this reason the author removed previous cast and applied next cast after manipulation on same day. 71.2% of patients' required Achilles tenotomy for correction of equinus, which is somewhat, less than the figure mentioned in the textbook[13].

A total of six patients enrolled in the trial did not achieve complete correction of clubfoot deformity by the ponseti technique. Of the 3 patients with persistent adduction and equinus deformity, two had short, stubby feet – the so-called atypical clubfoot. Attempts at correction of these feet did not meet with the same success as patients with typical clubfoot. One patient was treated by quacks previously and feet were already quite stiff and rigid therefore not responding to conservative treatment. All patients whose deformity could not be corrected by casting were treated surgically.

The major limitation of this study is that it lacks follow up of patients for a long period of time to assess for recurrence and for problems faced by these patients in later life. Dr. Ponseti and colleagues have followed up their patients for many years[14] and found that their patients did well over time. The maintenance phase in which foot abduction brace is worn is as important as the treatment phase and if bracing program is not followed properly, there are high chances of recurrence.

Conclusion

Ponseti method is an excellent option for management of Idiopathic clubfoot and should be regarded as the standard mode of treatment. Its efficacy remains unaltered if plaster casts are changed twice weekly and lead to correction in much shorter period of time.

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