

Comparative Study of the Results of Treatment of Idiopathic Congenital Club Foot by Accelerated Versus the Standard Ponseti Method

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ABSTRACT

Background: Congenital idiopathic clubfoot is a prevalent musculoskeletal congenital anomaly. The Ponseti technique is the conventional treatment, while the accelerated Ponseti technique seeks to reduce the length of treatment. Since no Bangladeshi research has evaluated these two approaches, this study sought to compare their results in terms of treatment length, number of casts applied, requirement for Achilles tenotomy, and ultimate Pirani score. **Methods & Materials:** This comparative prospective study involved 20 infants diagnosed with idiopathic congenital clubfoot, treated with either the accelerated Ponseti method (n=10) or the traditional Ponseti method (n=10). Outcomes of treatments were analyzed regarding treatment length, number of casts used, necessity for Achilles tenotomy, and ultimate Pirani score. Data were examined using SPSS-23, with $P < 0.05$ regarded as statistically significant. **Results:** Both groups had comparable baseline demographic and clinical characteristics and achieved similar deformity correction, number of casts required, need for Achilles tenotomy, and final Pirani scores. Excellent clinical outcomes were observed in both groups. However, the accelerated Ponseti method significantly reduced the overall treatment duration compared with the standard Ponseti method ($P = 0.007$) while maintaining comparable clinical outcomes. **Conclusion:** The accelerated Ponseti method is as effective as the standard Ponseti method in correcting idiopathic congenital clubfoot while significantly reducing treatment duration, making it a safe and efficient alternative for clinical practice.

Keywords: Idiopathic Congenital Club Foot, Accelerated Ponseti Method, Standard Ponseti Method

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INTRODUCTION

Congenital idiopathic clubfoot (congenital talipes equinovarus) is the most prevalent significant musculoskeletal birth defect, impacting 1–2 per 1,000 live births. Each year, 150,000 to 200,000 infants are born with clubfoot worldwide, with around 80% of cases occurring in low-resource nations^[1,2]. About 20% of clubfoot instances are linked to additional congenital abnormalities. The Pirani scoring system is a dependable and consistent clinical classification approach^[3]. Clubfoot is a three-dimensional malformation marked by adduction, equinus, and supination. It encompasses misalignment of the hindfoot and forefoot, leading to forefoot adduction, hindfoot equinus, and pes cavus, along with related bony deformities, soft tissue contractures, and atrophy of lower-limb muscles^[2,4]. The aim of therapy is to reach a pain-free, flat, and functional foot that allows for good movement and does not require specialized shoes. Initial nonoperative treatment, especially the Ponseti method, is the typical first strategy, as it offers superior correction and minimizes the necessity for extensive surgery^[5,6]. The Ponseti technique is the established standard treatment, employing serial casting, Achilles tenotomy (if necessary),

and bracing for successful correction. The accelerated Ponseti technique decreases cast durations to 2–3 days to lessen treatment duration, yet its effectiveness in comparison is still unclear^[7,8]. The traditional Ponseti technique involves weekly changes of casts with progressive foot abduction, while the accelerated Ponseti approach alters casts 2–3 times weekly employing the same manipulation method^[4]. International research indicates that the expedited Ponseti technique achieves clinical correction similar to the traditional Ponseti method, while notably shortening treatment time, and yields comparable rates of Achilles tenotomy, complications, and early treatment results^[4,9]. In Bangladesh, there is no available research that has contrasted the accelerated and standard Ponseti techniques for idiopathic congenital clubfoot. The aim of this study was to assess the treatment results of the accelerated Ponseti method versus the standard Ponseti method in infants with idiopathic congenital clubfoot by examining treatment duration, total casts used, necessity for Achilles tenotomy, and final clinical outcomes measured by the Pirani score.

METHODS & MATERIALS

Study Design and Setting

This prospective observational comparative study was conducted in the Department of Orthopaedic Surgery, National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dhaka, Bangladesh, from July 2022 to June 2023. The study compared the treatment outcomes of the accelerated Ponseti method with those of the standard Ponseti method in infants with idiopathic congenital clubfoot.

Study Participants

A total of 20 infants with untreated idiopathic congenital clubfoot were consecutively enrolled using purposive sampling and allocated into two treatment groups: the accelerated Ponseti group (Group I, n = 10) and the standard Ponseti group (Group II, n = 10).

Eligibility Criteria

Infants aged ≤ 6 months with unilateral or bilateral idiopathic congenital clubfoot whose parents or legal guardians provided written informed consent were included. Patients with syndromic or secondary clubfoot, relapsed or neglected clubfoot, other congenital deformities, persistent skin diseases, or previous treatment for clubfoot were excluded.

Treatment Protocol

All patients were treated according to the Ponseti technique, which consisted of sequential manipulation of the foot followed by application of long-leg plaster casts. In the accelerated Ponseti group, casts were changed twice weekly, whereas in the standard Ponseti group, casts were changed once weekly. Manipulation and casting continued until correction of cavus, adduction, and varus deformities was achieved. Percutaneous Achilles tenotomy was performed when residual equinus persisted after correction of the other deformity components. Following tenotomy, a final cast was maintained for three weeks before removal.

Data Collection and Outcome Measures

Baseline demographic data (age and sex) and clinical characteristics (laterality of involvement) were recorded. The severity of deformity was assessed using the Pirani scoring system before treatment and at completion of treatment. Treatment variables included the number of casts required, need for percutaneous Achilles tenotomy, treatment duration, and final

Pirani score. Patients were followed for six months after completion of treatment. The primary outcome was treatment duration, while secondary outcomes included the number of casts required, requirement for Achilles tenotomy, and final Pirani score.

Statistical Analysis

Data were analyzed using SPSS version 23.0. Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables were presented as frequencies and percentages. The independent-samples t-test was used to compare continuous variables, while the Chi-square test or Fisher's exact test was applied for categorical variables, as appropriate. A two-sided P value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional authority of NITOR. Written informed consent was obtained from the parents or legal guardians of all participants before enrollment.

RESULTS

A total of 20 infants with idiopathic congenital clubfoot were enrolled in the study. Ten patients were treated using the accelerated Ponseti method (Group I), while the remaining ten patients received the standard Ponseti method (Group II). All patients completed treatment and were followed for six months. Baseline demographic and clinical characteristics were comparable between the two groups. *Table I* shows the mean age of the patients was 52.9 ± 49.8 days in the accelerated Ponseti group and 35.3 ± 20.4 days in the standard Ponseti group, with no statistically significant difference between the groups (P = 0.311). Most patients presented within the first month of life (65.0%). Male patients accounted for 60.0% of Group I and 40.0% of Group II. Bilateral clubfoot was the predominant presentation in both groups (90.0%), whereas unilateral involvement was observed in only one patient (10.0%) in each group. None of the baseline demographic or clinical variables differed significantly between the treatment groups.

Table I
Baseline demographic and clinical characteristics of the study participants (n = 20).

Variable	Accelerated Ponseti (n=10)	Standard Ponseti (n=10)	P value
Age (days), mean ± SD	52.9 ± 49.8	35.3 ± 20.4	0.311
Age group, n (%)			
0–1 month	6 (60.0)	7 (70.0)	
2–3 months	2 (20.0)	2 (20.0)	
4–5 months	1 (10.0)	1 (10.0)	
6–7 months	1 (10.0)	0	
Sex, n (%)			0.371
Male	6 (60.0)	4 (40.0)	
Female	4 (40.0)	6 (60.0)	
Foot involvement, n (%)			1.000
Unilateral	1 (10.0)	1 (10.0)	
Bilateral	9 (90.0)	9 (90.0)	

Table II presents the majority of patients in both groups achieved correction with five casts, accounting for 80.0% of patients in All patients treated with the accelerated Ponseti protocol required percutaneous Achilles tenotomy in addition to serial casting, whereas eight patients (80.0%) in

the accelerated Ponseti group and 70.0% in the standard Ponseti group. The remaining patients required six casts. There was no the standard Ponseti group underwent tenotomy and two patients (20.0%) achieved correction with casting alone. The difference in treatment procedure between

statistically significant difference in the number of casts required between the two treatment groups (P = 0.606). the groups was not statistically significant (P = 0.474).

Table II
Treatment characteristics of the study participants (n = 20).

Variable	Accelerated Ponseti (n=10)	Standard Ponseti (n=10)	P value
Number of casts required, n (%)			0.606
5 casts	8 (80.0)	7 (70.0)	
6 casts	2 (20.0)	3 (30.0)	
Treatment procedure, n (%)			0.474
Plaster cast only	0	2 (20.0)	
Plaster cast with Achilles tenotomy	10 (100.0)	8 (80.0)	

Table III shows treatment duration was considerably shorter in the accelerated Ponseti group than in the standard Ponseti group. Among patients requiring five casts, correction was achieved in 35 days with the

accelerated protocol compared with 49 days using the standard protocol. Likewise, patients requiring six casts completed treatment in 39 days and 56 days, respectively. Overall, the accelerated

Ponseti method significantly reduced the duration of treatment without increasing the number of casts required (P = 0.007).

Table III
Comparison of treatment duration between the study groups.

Treatment duration	Accelerated Ponseti	Standard Ponseti	P value
Patients requiring 5 casts (days)	35	49	0.007
Patients requiring 6 casts (days)	39	56	0.007

Table IV shows at the final follow-up, excellent correction (final Pirani score = 0) was achieved in 80.0% of patients treated with the accelerated Ponseti method and 90.0% of those treated with the standard Ponseti method. The remaining patients had a final Pirani score of 0.5, indicating minimal residual deformity. No patient had a final Pirani score ≥ 1 . There was no statistically significant difference in final Pirani scores between the two groups ($P = 0.531$).

Table IV
Final clinical outcome according to Pirani score ($n = 20$).

Final Pirani score	Accelerated Ponseti (n=10)	Standard Ponseti (n=10)	P value
0	8 (80.0)	9 (90.0)	0.531
0.5	2 (20.0)	1 (10.0)	
Total	10 (100.0)	10 (100.0)	

Overall, both treatment protocols achieved comparable clinical correction of idiopathic congenital clubfoot. Although the number of casts required, need for Achilles tenotomy, and final Pirani scores were similar between the groups, the accelerated Ponseti method significantly shortened the overall duration of treatment compared with the standard Ponseti method. This reduction in treatment time was achieved without compromising the final clinical outcome.

DISCUSSION

The baseline demographic and clinical traits were similar in the accelerated and standard Ponseti groups, with no notable differences in age, sex, or laterality of involvement, suggesting well-matched study groups. The majority of infants were presented during the first month of life, with bilateral clubfoot being the most common presentation. These results align with earlier prospective studies indicating comparable baseline traits and reinforce a legitimate comparison of treatment result between the two Ponseti protocols [3,10].

The number of casts needed and the necessity for Achilles tenotomy showed no significant difference between the accelerated and standard Ponseti groups. Likewise, earlier research indicated that the majority of patients obtained correction with around 5–7 casts, and Achilles tenotomy was necessary in most instances (approximately 80–90%), validating the reliability and success of the Ponseti method [11,12].

The current study showed that the accelerated Ponseti technique notably shortened treatment time compared to the conventional protocol, while necessitating a comparable number of casts. These results align with earlier reviews that indicated that decreasing the time between cast changes shortens the overall treatment duration without affecting deformity correction or raising complication rates. The expedited protocol might enhance caregiver adherence and lessen the strain of extended treatment

while preserving the efficacy of the Ponseti technique [13,14].

The current research showed similar final clinical results between the accelerated and standard Ponseti techniques, with no notable difference in final Pirani scores, even though the treatment duration was significantly shorter in the accelerated group. These results align with earlier comparative studies, which indicated that the accelerated Ponseti protocol effectively corrects deformities and reaches final Pirani scores similar to the standard protocol, all while significantly decreasing total treatment duration, without raising complications or jeopardizing clinical results [3,15].

Overall, the accelerated Ponseti technique is a reliable and efficient substitute for the traditional Ponseti method, offering similar clinical results while notably shortening the treatment time for infants with idiopathic congenital clubfoot.

CONCLUSION

The accelerated Ponseti method is equally effective and safe as the standard Ponseti method for the treatment of idiopathic congenital clubfoot. It achieves comparable deformity correction, similar final Pirani scores, and no increase in the need for Achilles tenotomy or complications, while significantly reducing the overall treatment duration, making it a practical and time-efficient treatment option.

REFERENCES

1. Zions LE, Zhao G, Hitchcock K, Maewal J, Ebramzadeh E. Has the rate of extensive surgery to treat idiopathic clubfoot declined in the United States?. *JBJS*. 2010 Apr 1;92(4):882-9.

2. Solanki M, Ajmera A, Rawat S. Comparative study of accelerated Ponseti method versus standard Ponseti method for the treatment of idiopathic clubfoot. *Journal of Orthopaedics, Traumatology and Rehabilitation*. 2018 Jul 1;10(2):116-9.

3. Harnett P, Freeman R, Harrison WJ, Brown LC, Beckles V. An accelerated

Ponseti versus the standard Ponseti method: a prospective randomised controlled trial. *The Journal of Bone & Joint Surgery British Volume*. 2011 Mar 1;93(3):404-8.

4. Chu A, Labar AS, Sala DA, Van Bosse HJ, Lehman WB. Clubfoot classification: correlation with Ponseti cast treatment. *Journal of Pediatric Orthopaedics*. 2010 Oct 1;30(7):695-9.

5. Sharma P, Yadav V, Verma R, Gohiya A, Gaur S. Comparative Analysis of results between Conventional and Accelerated Ponseti Technique for idiopathic congenital clubfoot. *Orthopaedic Journal of Madhya Pradesh Chapter*. 2016 Jan 1;22(1):2-7.

6. Ahmed J, Shahid S, Alam W, Ahmed A, Hussain H, Akram R, Aziz A. Outcome of patients suffering from congenital idiopathic club foot: A comparative analysis of using classical versus accelerated Ponseti techniques. *Journal of Pakistan Orthopaedic Association*. 2019 Sep 30;31(02):44-7.

7. Rehman S, Hussain B, Ullah A. Comparison Of Accelerated Vs Standard Ponseti Technique Among Children's Having Congenital Talipes Equinovarus. *Journal of Ayub Medical College Abbottabad*. 2022 Jun 24;34(3 (SUPPL 1)).

8. Ganesan B, Luximon A, Al-Jumaily A, Balasankar SK, Naik GR. Ponseti method in the management of clubfoot under 2 years of age: A systematic review. *PloS one*. 2017 Jun 20;12(6):e0178299.

9. Kaptan AY, Korkmazer S, Eren TK. Comparison of The Clinical Results of Two Accelerated Ponseti Techniques for Patients with Clubfoot. *Selcuk Medical Journal/Selçuk Tıp Dergisi*. 2021 Jan 1;37(1):1.

10. Halanski MA, Davison JE, Huang JC, Walker CG, Walsh SJ, Crawford HA. Ponseti method compared with surgical treatment of clubfoot: a prospective comparison. *JBJS*. 2010 Feb 1;92(2):270-8.

11. Alqami MM, Hakami MH, Alhazmy SA. The outcome of Ponseti method for the treatment of clubfoot: a systematic review. *Int J Med Dev Ctries*. 2023 Aug 1;7:1381-8.

12. Doski JO, Jamal BI. Accelerated versus conventional Ponseti protocol for the

- treatment of idiopathic talipes equinovarus deformity: A short term follow up in Iraq. Zanco Journal of Medical Sciences (ZJMS). 2021 Apr 27;25(1):473-9.
13. Hennessey TA. Congenital clubfoot and the Ponseti method: a review of recent literature. Current Orthopaedic Practice. 2012 Sep 1;23(5):442-7.
 14. van Bosse HJ. Ponseti treatment for clubfeet: an international perspective. Current opinion in pediatrics. 2011 Feb 1;23(1):41-5.
 15. Gilani SF, Ahmed S, Obaid-Ur-Rehman MA. Comparison of accelerated VS standard Ponseti method in management of idiopathic clubfoot. Journal of Pakistan Orthopaedic Association. 2014 Jan 1;26(1):4-.