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ORIGINAL ARTICLE

EFFECTIVENESS OF ACCELERATED PONSETI THE TREATMENT OF CONGENITAL TALIPES EQUINOVARUS

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ABSTRACT

Background: Various treatment modalities are available in the management of club feet but main stay of treatment is manipulation of serial casting and in majority of cases percutaneous Achilles tenotomy. The objective of this study was to assess the effectiveness of accelerated Ponseti Techniques (PST) in the treatment of congenital talipes equinovarus.

Material and Methods: This descriptive study was conducted in the Orthopedic Department Jinnah Teaching Hospital Peshawar from July 2022 to July 2023. All the patients fulfilling the inclusion criteria were enrolled. The serial casting was given to all patients in the Outdoor Department. Outcome was assessed through the Pirani scoring system before and after casting. SPSS version 22 was used for statistical analysis. Frequencies and percentages were calculated for categorical variables. Mean± SD was calculated for numerical variables.

Results: Out of 52 patients, 32 (61.56%) were males and 20(38.46%) were female. Mean age of patients was 5.8±2.4 months. Base line Pirani score was 6 and the mean follow up Pirani score of patients was 1.48 ±1.01. Serial casting through accelerated technique (PST) was effective in 80.8%of patients. Patients treated with the accelerated Ponseti protocol achieved a mean Pirani score of 4.2, indicating significant improvement in foot deformity. Patients treated with the accelerated PST achieved initial correction in an average of 6.5 weeks.

Conclusion: Our study concludes that Accelerated PST is an effective treatment of Congenital Talipes Equinovarus. We recommend further studies with account taken into more variables which can determine the effectiveness of accelerated PST before recommending accelerated PST for club foot.

KEY WORDS: Congenital Talipes Equinovarus; Pirani score; Ponseti technique; Safe Therapy; Technique.

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INTRODUCTION

Club foot is a common inborn deformity. Out of 1000 live births, 1 to 2 newborns are suffering from it.[1] Club foot is basically a complex type of deformity in newborn babies, which include varus in hindfoot, cavus in midfoot, adduction in forefoot, and ankle joint equinus. It is also associated with other congenital condition such as anomalies of gastrointestinal, genitourinary, musculoskeletal abnormalities and neural tube defect.[2]

Various treatment options are available at different stages, but the main objective of management is to correct the deformity and retain mobility and strength. The goal of treatment is to correct all parts of foot deformity in order to achieve painless, plantigrade foot with a normal load-bearing area.[3] If an appropriate treatment in the form of serial casting is started early then it will give good long-term outcomes.[4]

The PST has been considered as standard gold care for the management of idiopathic club foot by most orthopedic surgeons because it significantly decreases the rate of surgical management of clubfoot.[5] This method consists of manipulation and above knee serial casting on a weekly basis.[6]

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Weekly serial casting is standard care of treatment used in ponseti method, but accelerated protocols have been reported which includes twice weekly cast with advantage of early deformity correction and good compliance of parents of patients. [7] Accelerated ponseti techniques help the patient to short total duration of their plaster treatment that help the patient to remove their cast early and achieved early recovery from disease.[8]

In our setup, patients belong to local as well as far-flung areas from other districts and mostly are poor patients. The standard PST takes approximately two months, which becomes difficult for these patients to complete their treatment because of their poor socioeconomic status. Our study follows the shorter regime of 4 weeks to see that our result is comparable with the standard weekly technique. The effectiveness of the accelerated PST in the treatment of congenital talipes equinovarus is a topic of significant interest and ongoing research. The main objective of this study was to contribute to the existing literature by evaluating the outcomes and benefits of the accelerated Ponseti method compared to the traditional approach. Through a comprehensive assessment of correction rates, complications, and patient satisfaction, we will seek to provide valuable insights into the potential advantages of this innovative treatment modality for clubfoot. Ultimately, the findings of this research may inform clinical practice and improve the management of congenital talipes equinovarus, potentially offering a more efficient and patient-friendly approach in achieving plantigrade feet.

MATERIAL AND METHODS

This Descriptive cross-sectional study was conducted in the Jinnah Teaching Hospital Peshawar from July 2022 to July 2023. All the patients who had a clinical diagnosis of a club foot including both genders, age up to one year, and having no previous record of treatment for club foot were enrolled. Patients with a history of previous clubfoot treatment or patients with comorbidities or congenital syndromes affecting limb development were excluded from surgery. Informed written consent was taken from parents of patients. All the patients meeting the inclusion criteria were assessed with the Pirani score. The serial casting was made twice a week in all the patients. Pirani score was done before and after the application of each cast. Pre cast and post cast improvement was documented in all patients. The deformity was corrected in the order mentioned in the standard PST that is first correct cavus, second varus and adduction, and the last correction is of equinus. The equinus need percutaneous Achilles Tenotomy in the majority of cases. The Achilles Tenotomy was done under local anesthesia as an outdoor procedure. The last cast was given for three weeks in abduction and external rotation. Dennis brown splint was applied to all patients for three months, twenty-three hours in a day with weaning of one hour. The diagnosis and castings were done by expert orthopedic surgeon having a vast experience in dealing such pediatric foot deformities. All the patients are reevaluated after one and three months in OPD for follow up. All the patients were reassessed on the basis of the Pirani score to determine the effectiveness of the procedure.

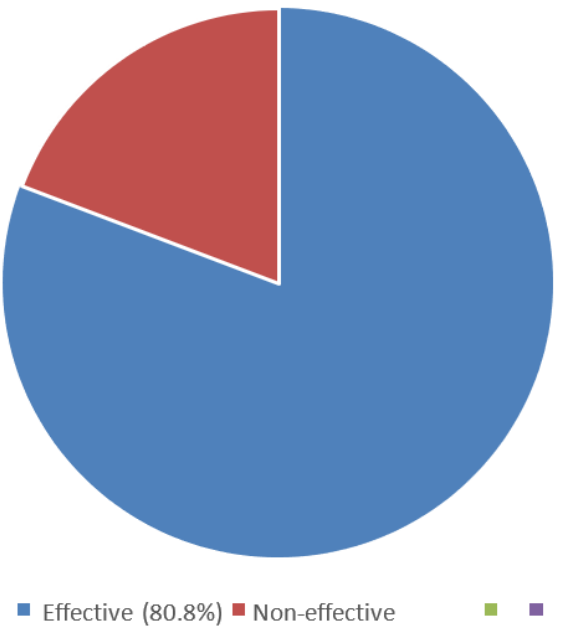
All the above-mentioned information, including name, age, gender, and address, was recorded on a pre-designed proforma.Statistical analysis was done using IBM SPSS 22. Frequencies and percentages were calculated for categorical variables. Mean ± SD was calculated for numerical variables. Effectiveness of accelerated PST was stratified among the age, gender, and baseline Pirani score to see the effect modifiers.

RESULTS

In this study, a total of 52 children were included who were diagnosed with idiopathic talipes equinovarus. Majority of the children were male patients 32 (61.5%), and female children were 20(38.5%) with an average age of 5.85±2.41 ranged from (3-10) months. At baseline, the Pirani scores were 6±0.20. All patients were followed up after the end of 3 months to see improvement in the Pirani score of more than four from baseline. The mean follow up Pirani score of patient's was1.48+1.01. When the study assessed the effectiveness the accelerated PST showed good outcome 42 (80.8%).

Table1; Stratification of the Demographic profile of patients

Gender	Male	32(61.5)
	Female	20(38.5)
Age		5.85±2.41
BaselinePirani score		6±0.20
Follow Up Pirani Score		1.48±1.02
Effectiveness	Yes	42(80.8)
	No	10(19.2)



Graph 1: Showing the Effectiveness of accelerated PST in the treatment of congenital talipes equinovarus (n=52)

DISCUSSION

During the last few decades, there has been a change in the trend from extensive soft tissue release as a definitive surgical procedure to less invasive procedures in the form of serial castings and percutaneous procedures in the form of tenotomies.[9] Both short term and long term data are available on the Ponseti method showing success rate up to 98% in the correction of club foot deformity.[10] Our study shows the effectiveness of up to 80% in treating these patients with accelerated PST. We achieve a comparable result to available published data in a relatively short period of time by doing serial casting twice a week. OA lasebekan et al treated 175 patients with 273 clubfeet. Total no of casts used for correction were 6.3 while mean pirani score at presentation was 4. Correction achieved with help of ponseti technique was (96.6%) in majority of feet while 3.4% feet need additional surgical procedure to correct the deformity.[11]

Morcuende et al. did the longest retrospective study between the weekly cast and 5 days casting regimen and he concluded that accelerated casting technique could be as effective as standard Ponseti regimen.[12] Another study conducted by Harnet et al. adopted a more accelerated type of technique with three times serial casting regimen. Their result was comparable to the weekly and 5th day casting technique, and the rate of percutaneous Achilles tenotomy was done in 79% cases.[13] Ibrahim et al., in their study, showed that an accelerated ponseti method needs a greater number of casting as compared to the standard technique, although their results are the same.[14]

Our aim was to reduce the duration of plaster that is to be given to the patients by doing serial casting twice a week. This will decrease the duration of treatment, which has an advantage to the patient as well as their care take because enhancing the treatment will shorter the duration of treatment and decrease the overall cost on a treatment regimen. This will also help us in avoiding disuse atrophy, which mainly occurs with prolonging immobilization. This patient will go the maintenance phase in the form of bracing at an early age and probably amenable age. Pressure sore, skin rashes, and sometimes ulcer formation are a major complication of accelerated PST, which can be overcome by gentle manipulation, well padding of bony prominences by orthoban and early detection, and timely management of such complication.

CONCLUSION

Our study concludes that Accelerated PST is an effective for treatment of Congenital Talipes Equinovarus. We recommend further studies with account taken into more variables which can determine the effectiveness of accelerated PST before recommending accelerated PST for club foot.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	AI, SA
Acquisition, Analysis or Interpretation of Data:	AI, SA, SA, LK, BH, AUJ
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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.