



## EVALUATING OUTCOME OF SHORT-TERM TREATMENT FOR IDIOPATHIC CLUBFOOT WITH PONSETI METHOD

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### ABSTRACT

**Introduction** -clubfoot (CTEV) is One of the most common structural and visible birth defects and is responsible, for major Disability in children. Diagnosis of clubfoot is generally clinical since the deformity is obvious at birth. Aim of our study to evaluate pattern of presentation and short-term treatment outcome of ctev with the Ponseti method. **Material And Methods**- retrospective cohort study on children presenting with CTEV in department of orthopaedics, N.S.C.B. Medical College & hospital, Jabalpur (M.P). Number of patients was based on those attending the clubfoot clinic from 1st January 2019 to 31st Dec 2020. Patients with underlying neuromuscular conditions and deformities related to trauma, tumour and infection were excluded from the study. **Results**- There were 50 children with 75 clubfeet treated in our institution during the study period. There were more boys (32) compared to girls (18), with a ratio of 1.7:1, with 25(50%) bilateral deformities, and 25 (50%) unilateral deformities. The mean age of patients at presentation was 7.7 months. The mean number of cast change for all the feet was 5.2 ranging from 3 to 8 changes. The mean duration of casting was 2.7 months (range: 1 – 6 months). Of the 50 patients, 23 (46%) required percutaneous Achilles tenotomy. With 70 of the 75 feet responding to treatment, our initial success rate was 93.3%. The mean period of follow up was 14.1 months, ranging from four to 30 months. **Conclusion**- With the initial success rate of 93.3%, our study showed that the Ponseti method of treatment was effective in the treatment of CTEV even for those who presented late.

### KEYWORDS :

#### INTRODUCTION-

Congenital talipes equinovarus (CTEV) also known as Clubfoot is a common congenital foot deformity with an estimated incidence of 1-2 per 1000 live birth<sup>1</sup>. One of the most common structural and visible birth defects, responsible for major Disability in children. The involvement is bilateral in about 50% of cases and in Unilateral cases, the right side is affected slightly more common than left<sup>1</sup>. If left untreated, the deformity will persist and gradually become rigid due to secondary changes in the tarsal bones and joints<sup>2</sup>. Extensive soft tissue surgery had been considered as the optimal treatment for idiopathic clubfoot<sup>3</sup>. In the late 90s, non-operative treatment gradually became popular following publication of long term treatment outcome by Ponseti and his team<sup>3,4,5</sup>. Diagnosis of clubfoot is generally clinical since the deformity is present at birth. In less developed countries, late presentation is common due to lack of awareness, availability of treatment or delay in referral. Aim of our study is to evaluate functional outcome of short-term treatment of CTEV with the Ponseti method.

#### MATERIAL AND METHODS-

This is a retrospective cohort study on children presenting with CTEV in department of orthopaedics, N.S.C.B. Medical College & hospital, Jabalpur (M.P) from 1st January 2019 to 31st Dec 2020. Patients with underlying neuromuscular conditions and deformities related to trauma, tumour and infection were excluded from the study. Those with flexible clubfeet that did not require any manipulation or casting were also excluded. Participant parents were explained in his/her language regarding his/her disease/deformity, investigation details, a management protocol, alternative measures, anticipated outcome and probable complications related to management after giving informal consent.

All patients of clubfoot were examined and case history recorded including demographic data, age at presentation, any prior treatment history, casting procedure and clinical outcome on follow up etc. All the patients with CTEV were classified by using Pirani score<sup>6</sup> and treated with weekly foot manipulation and change of plaster casts according to the principles and techniques described by Ponseti<sup>4</sup>. Achilles

tenotomy was done when the foot was passively able to achieve at least 60 degrees of external rotation in relation to the long axis of the tibia. In our institution, tenotomy procedures were most commonly performed under general anaesthesia. The final cast was applied for three consecutive weeks, after which the patients were required to use an abduction orthosis. Parents were advised to use full time shoe abduction orthosis until the child started pulling up to stand. They were advised to use the abduction orthosis for twenty-three hours a day. After that, the child would only wear the abduction orthosis for about six hours at night. A fully corrected deformity was defined as those feet that we were able to achieve a corrected midfoot position with the absence or minimal medial crease, minimal curved lateral border and non-palpable lateral head of talus.

#### RESULTS-

There were 50 children with 75 clubfeet treated in our institution during the study period. There were more boys (32) compared to girls (18), with a ratio of 1.7:1, with 25(50%) bilateral deformities, and 25 (50%) unilateral deformities. When unilateral, the left feet were more commonly affected (15, 60%) than the right feet (10, 40%). The mean age of patients at presentation was 7.7 months. There were only three patients who presented within four weeks after birth, and three patient was referred at the age of 24 months for treatment. This patient presented at a late stage, as he had been treated in a different medical facility prior to being referred to our centre. The mean number of cast change for all the feet was 5.2 ranging from 3 to 8 changes.

The mean duration of casting was 2.7 months (range: 1 – 6 months). Of the 50 patients, 23 (46%) required percutaneous Achilles tenotomy. Out of our 50 patients with 75 club feet, we were not able to correct the deformity of 3 patients (6%) with 5 club feet (6.6%) and they were diagnosed to have resistant clubfoot. They subsequently required soft tissue surgery for the correction of their deformities. With 67 of the 75 feet responding to treatment, our initial success rate was 89.9%. The mean period of follow up was 14.1 months, ranging from four to 30 months. In our study 5 patients with 7 feet develop relapsed (9.2%). The initial presentations of these five cases

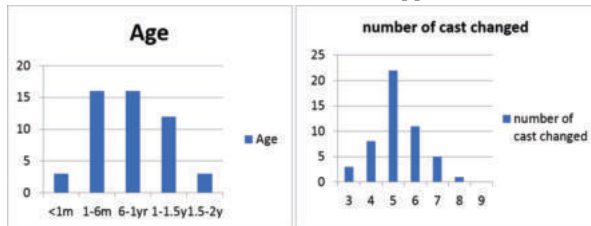
did not vary significantly from the others, in terms of the severity of their deformity or the resistance to passive correction. However, as the serial casting was applied, it was noted that the progress in these five patients was slower than the other patients in this report. There was no underlying pathological differences between the cases. However, the compliance to abduction brace wear was poor among these five patients. All of these five patients and two resistant case were successfully treated with repeated serial casting and a repeat percutaneous heel cord tenotomy. One resistant case required a medial soft tissue release in combination with a tendo-Achilles lengthening procedure.



**Figure:1**  
1yr old female  
with b/l ctev

**Figure:2**  
tendo-achilles  
tenotomy

**Figure:3**  
above knee cast  
applied



**DISCUSSIONS-**

In our study, the number of boys was close to two times the number of girls, with a ratio of 1.7:1. This is contrary to local studies conducted by Boo<sup>7</sup> and Rasit<sup>8</sup> that showed equal number of patients between the two genders. However, studies from Sweden<sup>12</sup> and West Australia<sup>13</sup> reported male predominance with the ratio of 2.4 and 2.0 to 1 respectively.

half of our patients had unilateral clubfoot (50%), and this is consistent with studies by Rasit<sup>8</sup> and Wallander<sup>9</sup> who reported 67% and 54% of unilateral cases respectively. We had more left sided (60%) unilateral clubfoot. In the literature, Byron<sup>10</sup> and Wallander<sup>9</sup> reported that right unilateral clubfoot was more common, while other studies by Boo<sup>7</sup> and Rasit<sup>8</sup> reported that the left side was more commonly affected.

The initial success rate of treatment by serial manipulation and casting reported by Ponseti and Smoley<sup>11</sup> in 1963 was 80%. From the 75 clubfeet that we treated, we were not able to achieve full correction in five feet (6.6%) even after tenotomy, giving rise to an initial success rate of 89.9%. This is a relatively good result considering that the mean age at presentation of our patients was 7.7 months, and that 15 out of 50 patients (30%) came for treatment after 1 year of age. Lehman *et al*<sup>12</sup> reported 92% success rate in treatment of younger children less than 7 months old. A recent study by Verma *et al*<sup>13</sup> reported an initial successful rate of 89% in older children aged between one to three years.

In our study, we observed a relapse rate of 9.8%. This is consistent in comparison to the more recent experience from Morcuende<sup>14</sup> who reported a relapse rate of about 10%. Higher relapse rates had been reported by Changulani<sup>15</sup> at 32%. One of the main reasons for developing relapse was lack of compliance with using abduction shoe orthosis. Some parents admitted that they had problem with regular wearing of abduction shoe splint for their children, and occasionally, the supplier was not able to provide the proper size splints in time. Although 5 of the 75 (6.6%) feet were diagnosed as resistant clubfeet and eventually required extensive soft tissue surgery,

subsequent relapse in 7 feet were successfully treated with repeat serial manipulation and casting. Ponseti and Smoley<sup>11</sup> reported that open surgery was avoided in 89% of cases. Changulani<sup>15</sup> on the other hand reported that 81% of their cases could be corrected without the need for soft-tissue release.

The main limitation of this study is the small number of patients and short follow up. However, the study was able to show that many patients in this country presented late and more effort should be organised to improve awareness on the need for early treatment.

**CONCLUSION-**

With the initial success rate of 93.3%, our study showed that the Ponseti method of treatment was effective in the treatment of CTEV even for those who presented late (mean of 7.7 months after birth).

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