Original Research Article

A Study of orthopaedic management of club foot at tertiary health care centre

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Abstract

Background: Congenital talipes equinovarus (CTEV) is one of humanity's oldest and most frequent congenital malformations, affecting one to two out of every thousand live births **Aims and Objective:** To Study orthopaedic management of club foot at tertiary health care centre. **Methodology:** This was cross-sectional study carried out in the department of orthopaedic with idiopathic club foot less than one year age presented to the orthopaedic department during the three-year period i.e. June 2018 to June 2021 were included into the study. In the three-year period there were 93 enrolled to study. Modified Pirani score noted. All of them undergone ponsetti technique ponsetti technique for the management of idiopathic club foot. At the end all of them evaluated by Pirani score. The statistical analysis was done by paired t-test and calculated by SPSS 19 version software **Result:** In our study we have found. The majority of the patients were in the age group of 0-3 (months) were 48.08%, followed by 3-6 were 25.00%, 6-9 were 17.31%, 9-12 were 9.62%. The majority of the patients were Female i.e. 67.31% and Male were 32.69% in all the age groups the Post treatment Pirani score significantly differed as compared to pre-treatment score i.e. 0-3 (n=39) were 5.29 ±2.12 and 1.53 ± 1.034 (t=9.87,df=77,p<0.01); 3-6(n=28) - 5.45± 0.87 and 1.56 ± 1.27 (t=13.58,df=55,p<0.001); 6-9(n=15) were 5.78 ± 2.18 and 2.12±0.98 (t=8.94,df=29,p<0.05); 9-12 (n=11) - 5.34 ± 1.28 and 1.87 ± 1.38 (t=10.23,df=21,p<0.001) were statistically significant . **Conclusion:** According to the results of our investigation, the ponsetti approach was very efficient in the management of idiopathic club foot, as measured by the Pirani score for club foot assessment almost all the patients were doing well with this treatment.

Key Words: Club Foot, Modified Pirani Score, Ponsetti technique, Outcome of Club foot.

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INTRODUCTION

Congenital talipes equinovarus (CTEV) is one of humanity's oldest and most frequent congenital malformations, affecting one to two out of every thousand live births.[1] The four essential elements of the Ankle equinus, heel varus, forefoot adduction, and cavus are all deformities.[2,3] The non-operative therapy of clubfoot is widely considered as the first line of defence and should begin as soon as feasible after birth. Hippocrates advocated moderate foot massage followed by splinting in 400 BC, which was the first non-operative treatment. Guerin invented the plaster-of-Paris cast in 1836. Devices like the Thomas wrench, which practised quick correction through strong manipulation, were introduced around the turn of the century.[4] Dr. Hiram Kite pioneered the process of delicate manipulation and casting in 1930. Dr. Ignacio V. Ponseti invented the most frequently used manipulation and serial casting technology in 1948. The Ponseti technique has been the most widely accepted method, with a few studies demonstrating its short- and long-term success at various locations.[5,6] In this study we have studied the effectiveness of integrated method of Ponseti in the management of club foot at tertiary health care centre

METHODOLOGY

This was cross-sectional study carried out in the department of orthopaedic with idiopathic club foot less than one year age presented to the orthopaedic department during the three-year period i.e. June 2018 to June 2021 were included into the study. In the three-year period there

were 93 patients after written explained consent were enrolled to study. All necessary details of the patients were noted like age, sex, pre interventions modified Pirani score noted.

Table 1: Modified Pirani score

Parameters	Mild	Moderate	Severe
Mid foot			
Curved lateral border	0	0.5	1
Medial foot crease	0	0.5	1
Talar head coverage	0	0.5	1
Hindfoot			
Posterior crease	0	0.5	1
Rigid equines	0	0.5	1
Empty heel	0	0.5	1

Source (7) Maximum score is 6; Minimum score is 0.

All of them undergone all routine investigations including radiological like USG etc. All of them undergone ponsetti technique for the management of idiopathic club foot. Ponseti Method The Ponseti method consists of 2 equally important phases: the corrective phase and the maintenance[8] phase and consist of serial manipulation, casting and tenotomy of the Achilles Tendon.[9] This is followed by the use of foot abduction brace to prevent the occurrence of relapse. All these procedures are divided into two phases;[8] Casting Phase which consist of Manipulation, Casting and Tenotomy[8] Maintenance Phase which is the use of Foot Abduction Brace to prevent relapse or recurrence[9-10] All such procedures were carried out in our institute At the end all of them evaluated by Pirani score. The statistical analysis was done by paired t-test and calculated by SPSS 19 version software.

RESULT

Table 1: Distribution of the patients as per the age (months)

Age (months)	No.	Percentage (%)
0-3	39	41.94
3-6	28	30.11
6-9	15	16.13
9-12	11	11.83
Total	**93**	**100.00**

The majority of the patients were in the age group of 0-3 (months) were 48.08%, followed by 3-6 were 25.00%, 6-9 were 17.31%, 9-12 were 9.62%.

Table 2: Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Female	57	61.29
Male	36	38.71
Total	**93**	**100.00**

The majority of the patients were Female i.e. 67.31% and Male were 32.69%

Table 3: Distribution of the patients as per the Pirani score

Age group	Pre-treatment score	Post treatment score	p-value (paired t-test)
0-3 (n=39)	5.29 ±2.12	1.53 ± 1.034	t=9.87,df=77,p<0.01
3-6(n=28)	5.45± 0.87	1.56 ± 1.27	t=13.58,df=55,p<0.001
6-9(n=15)	5.78 ± 2.18	2.12±0.98	t=8.94,df=29,p<0.05
9-12 (n=11)	5.34 ± 1.28	1.87 ± 1.38	t=10.23,df=21,p<0.001

In all the age groups the Post treatment Pirani score significantly differed as compared to pre-treatment score i.e. 0-3 (n=39) were 5.29 ±2.12 and 1.53 ± 1.034 (t=9.87,df=77,p<0.01); 3-6(n=28) - 5.45± 0.87 and 1.56 ± 1.27 (t=13.58,df=55,p<0.001); 6-9(n=15) were 5.78 ± 2.18 and 2.12±0.98 (t=8.94,df=29,p<0.05); 9-12 (n=11) - 5.34 ± 1.28 and 1.87 ± 1.38 (t=10.23,df=21,p<0.001) were statistically significant .

DISCUSSION

One of the most frequent congenital musculoskeletal deformities seen by paediatric orthopaedic surgeons is Talipes Equinovarus.[11,12] It entails all aspects of the musculoskeletal system, including bones, muscles, joints, tendons, and ligaments. Cavus (curve at medial arch), Adduction of forefoot, Varus at hindfoot, and Equinus at ankle joint are the major abnormalities in club foot.[13,14] The Talus and Tarsal bones have an aberrant connection, in which the Tarsal bones adopt flexion, medial rotation, and inversion while the Talus is plantar flexed.[15] Equinus and varus of the heel are the results of these modifications.[16] The soft tissues below the knee are constricted and shortened. Although the specific cause of clubfoot has yet to be determined, numerous ideas suggest that both hereditary and environmental factors are at

blame.[17] According to recent studies, illiteracy and poverty are two factors that cause some affected children to be neglected, making it more difficult to correct the deformity.[18] Oligohydramnios, family history, male baby, first baby, and twin pregnancy are all risk factors. Because clubfoot is a visible deformity, there is no need for a particular inquiry or screening programme to discover it, albeit it can be detected prenatally using high-resolution ultrasound during the second trimester.[16] In our study we have found The majority of the patients were in the age group of 0-3 (months) were 48.08%, followed by 3-6 were 25.00%, 6-9 were 17.31%, 9-12 were 9.62%. The majority of the patients were Female i.e. 67.31% and Male were 32.69% in all the age groups the Post treatment Pirani score significantly differed as compared to pre-treatment score i.e. 0-3 (n=39) were 5.29 ±2.12 and 1.53 ± 1.034 (t=9.87,df=77,p<0.01); 3-6(n=28) - 5.45± 0.87 and 1.56 ± 1.27 (t=13.58,df=55,p<0.001); 6-9(n=15) were 5.78 ± 2.18 and 2.12±0.98 (t=8.94,df=29,p<0.05); 9-12 (n=11) - 5.34 ± 1.28 and 1.87 ± 1.38 (t=10.23,df=21,p<0.001) were statistically significant. This was similar to M Mahendra Kumar Reddy *et al.* [19] they found the majority of the patients were in the age group of 0-3 (months) were 48.08%, followed by 3-6 were 25.00%, 6-9 were 17.31%, 9-12 were 9.62%. The Majority of the patients were Female i.e. 67.31% and Male were 32.69%. In all the age groups the Post treatment Pirani score significantly differed as compared to pre-treatment score i.e. 0-3 Years. (n=25)- 6.12 ±1.94 and 1.23 ± 0.98 (t=11.24, df=49, p<0.0001); 3-6 Years. (n=13) were 5.89± 2.12 and 0.95 ± 0.23 (t=12.34, df=49, p<0.0001); 6-9 Years. (n=9) were 6.32 ± 3.12 and 0.78±0.13 (t=13.45, df=49, p<0.0001); 9-12 Years. (n=5)- 5.63 ± 3.54 and 1.17 ±0.56(t=10.27, df=49, p<0.001) overall in all age groups score was 5.99 ± 0.30 and 1.03±0.21 (t=12.92, df=103, p<0.001) respectively in Pre-treatment score and Post treatment score Wazir Fahad Jan [7] also found that Majority of the patients obtained full correction with this method. The mean value of the modified Pirani score improved from the pre-treatment value of 5.30 to 0.36 at the final follow up.

CONCLUSION

According to the results of our investigation, the ponsetti approach was very efficient in the management of idiopathic club foot, as measured by the Pirani score for club foot assessment almost all the patients were doing well with this treatment.

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