Evaluation of Outcome of Treatment of Idiopathic Congenital Club Foot by Ponseti Technique under the Age of Two Years

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Clubfoot is the commonest congenital deformity in babies. Around 80% of the cases occur in developing nations. There are many option for treating club foot, Ponseti technique is one of them. This Prospective interventional study was carried out in the Dept. of Orthopaedics and Traumatology, Dhaka Medical College Hospital (DMCH), during the period of January, 2011 to June, 2013. Thirty patients with forty five feets were treated and followed up for the purpose of this study. Both rigid and non rigid variety of club foot was treated irrespective of sex and side of foot involvement. Pirani scoring system was used to assess the severity of deformity, needs of tenotomy and evaluation of result. All the patients were treated by Ponseti technique, only 5 (11.1%) feet by plaster, 40(88.9%) feet required tenotomy . There were complications of 7(15.6%) feet of 4 patients in the form of plaster sore. All patients were under bracing protocol except one. In this study it is found that 80% satisfactory result. So Ponseti technique is a safe, effective and low cost and easily acceptable treatment for in idiopathic congenital club foot under the age of two years.

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Key words: Congenital, clubfoot, Ponseti

Introduction

Clubfoot is the commonest congenital deformity in babies. More than 100,000 babies are born worldwide each year with congenital clubfoot. Around 80% of the cases occur in developing nations.[1] Clubfoot is a complex deformity in which the foot is completely turned inward at birth. Idiopathic clubfoot occurs worldwide with an incidence varying from 0.39 to 8 per 1000 live births .It is the seventh amongst common congenital defect and the first for the musculoskeletal system. There are many options for treating club foot, Ponseti technique is one of them.[2]

The Ponseti technique involves gentle staged correction of the deformities of clubfoot. Weekly manipulations are performed and the foot is cast in plaster of Paris at the maximum correction at the end of every manipulation. The cast is removed before the next manipulation and the correction is slowly increased. In many cases full correction is aided by percutaneously tenotomy prior to the application of the last cast. Once full correction of the clubfoot has been achieved, the patient is given a Denis Browne splint to maintain the correction.[3] This must be worn full time for the first three months and thereafter at night up to the age of four years.

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Methods

The present prospective interventional study was carried out at the Department of Orthopaedic and Traumatology, DMCH, over period of 1 year and 6 months to evaluate the result of treatment of idiopathic congenital club foot by Ponseti technique under the age two years. Patients of idiopathic congenital club foot attended at DMCH were the study population. A total of 30 patients of 45 feet (both rigid and non-rigid variety, unilateral or bilateral) under the age of 2 years irrespective of sex, were included in the study. Patients with other congenital deformity, relapsed club foot, neglected club foot and age above 2 years were excluded from the study.

Results

A total of 30 children enrolled in this study. Their age distribution is presented in Table I. Both male and female children were enrolled. 70% of them were male and 30% were female (Table II). Both sided foot were involved and distributed as Table III. We found Rigid and Non-rigid clubfeet, of them about 89% were Rigid and 11% were Non-rigid (Table IV). Tenotomy was done for 40 involved feet out of 45 (Table V)

Among 45 clubfeet 36 (80%) had Satisfactory outcome, 9 (20%) unsatisfactory outcome (Table VI). In this study it is found that 80% satisfactory result among 45 feet of 30 patients of idiopathic congenital club foot treated by Ponseti technique. If this procedure put in total population then 72.20% to 87.79% satisfactory result will be found in confidence interval (at 95% level). It is quite acceptable outcome.

Table I: Distribution of the patient by age

Age in months	Number of patients	Percentage
0 to 6 months	18	60
6 to 12 months	5	16.7
12 to 18 months	5	16.7
18 to 24 months	2	6.7
Total	30	100

Table II: Distribution of patients by sex

Sex	No of patients	Percent
Male	21	70.0%
Female	9	30.0%
Total	30	100.0

Table III: Distribution of the patients by involvement of foot

Involvement of foot	No. of foot involved	Percent
Right	10	33.3
Left	5	16.7
Bilateral	15	50.0
Total	30	100.0

Table IV: Distribution of type of clubfoot

Type of clubfoot	Frequency	Percent
Rigid	40	88.9
Non Rigid	6	11.1
Total	45	100.0

Table V: Distribution of the feet by tenotomy

Tenotomy	No of feet	Percent
Done	40	88.9
Not done	5	11.1
Total	45	100.0

Table VI: Distribution of the patients by final outcome

Result	Frequency	Percent
Satisfactory	36	80
Unsatisfactory	9	20
Total	45	100.0

Figure 1. Photographs of clubfoot patient, clubfoot corrected by plaster, foot abduction brace, after 3 months, respectively

Discussion

Clubfoot is a complex deformity in which the foot is turned inward at birth. It is the fixation of the foot in cavus, adductus, varus and equinus which is inclined inwards, axially rotated outwards, and pointing downwards with concomitant soft tissue abnormalities. It is the seventh amongst common congenital defect and the first for the musculoskeletal system. Idiopathic clubfoot occurs worldwide with an incidence varying from 0.39 to 8 per 1000 live births.[4]

In this study, the age distribution of the patients was done. Among 30 cases, the highest numbers are in the age group of below 6 month which is 60%. The second highest numbers of cases (33.4%) are the age group between 6 months to 18 months. The lowest number of cases is the age group between 18months to 24 months which is only 6.7%. Percentage of the child within the age group 0-6 month is significantly higher than the other age group.[5]

In this study, within 30 cases, the male patients were more frequent than female patients which are 21(70%) and 9(30%) respectively. Percentage of male patients was higher than female.

In 30 clubfoot patients, bilateral involvement of foot was observed in 15 (50%) cases. The unilateral right foot involvement is 10(33.3%) and left foot involvement is 5(16.7%). Among all deformed feet (45in number) 40 (88.9%) feet of 26 patients had rigid variety and 5 (11.1%) feet of 4 patients had non-rigid variety. Percentage of rigid was higher than non rigid variety.[6]

In this study out of 45 feet 40(88.9%) feet of 26 patients was corrected by plaster with tenotomy and 5 (11.1%) feet of 4 patients by plaster only. Percentage of tenotomy was higher than in comparison to without tenotomy.

In the 45 feet, 38 (86.4%) feet of 26 patients had no complication and 7 (15.6%) feet of 4 patients had complication (plaster sore). Percentage of no complication was higher than in comparison to with complication.

Among 30 club foot patients, proper application of Denis-Brown splint was used in 29(96.7%) cases and only 1 (3.3%) cases it was not used. The difficult part of this study was maintenance of bracing protocol. Initial two or three days were the critical period as reported by the parents. After that patients were adjusted with splint.

Out of forty five feet, after correction 36 feet (80%) had final Pirani score 0 which is normal, in 7 feet (15.6%) final Pirani score was 0.5 which is moderately abnormal, in 2

feet (4.4%) final Pirani score was 1 which is severely abnormal. Percentage of final score 0 was higher than in comparison to with final score 0.5 and 1. In this study it is found that 80% satisfactory result among 45feet of 30 patients of idiopathic congenital club foot treated by Ponseti technique. If this technique put in total population then satisfactory result will be found in following confidence interval (at 95% level). So, among the population we will found 72.20% to 87.79% satisfactory result by this technique. It is quite acceptable outcome. In this study the average follow up period for these patients were 6 months.[7]

Conclusion

Ponseti technique for treatment of idiopathic congenital clubfoot has been gaining popularity due to its effective outcome. The difficult part of this technique was maintenance of bracing protocol. Initial two or three days were the critical period as reported by the parents. After that patients were adjusted with splint. Treatment of clubfoot by Ponseti technique avoids the complications of surgery and gives a painless, mobile, normal looking; functional foot which requires no special shoes and allows good mobility. It is simple, effective, minimally invasive, inexpensive and can ideally performed at out patient department. It is easy on baby and parents.

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