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OUR EXPERIENCE WITH PONSETI TREATMENT IN THE MANAGEMENT OF CLUBFOOT DEFORMITY AT SECONDARY CARE CENTERS IN LOWER SOCIOECONOMIC GROUP PATIENTS

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Abstract

Club foot also known as congenital talipes equinovarus (CTEV), is a congenital deformity involving one or both feet. The problem is more serious in the developing countries on account of late presentation; higher rate of dropouts (of treatment) and superstitious beliefs attached to this congenital problem especially in rural population

Methods: A total of 70 club feet were enrolled in the study 55 had unilateral club feet and 10 had bilateral involvement and five were lost to follow-up hence excluded from the study. Majority of patients in our study had unilateral club foot deformity. Plaster was applied in two stages in phases correction phase and maintenance phase .

Results: Average no of plasters applied to achieve complete correction in patients who presented early ranged from 5-7 whereas in late presenters average no of Ponseti casts application ranged from 10 -14. Ponseti Tenotomy was required in 36 patients (90%) in early presenters whereas all 30 (100%) patients who were late presenters required Ponseti Tenotomy. There was wide variation in age of patients who underwent Ponseti management for correction of CTEV

Conclusion: In conclusion Ponseti is safe and effective in the early stages of correction of clubfeet even at peripheral hospitals. Only issue being extra counseling required for attendants who are usually poor and no avenues

to get their kids treated at tertiary care centers Immediate counseling by trained nurses at first contact should be part of treatment in motivating couples with club foot born child to start treatment in nearest hospitals and maintaining of register for regular follow-up.

Keywords: club foot, Ponseti cast, pirani score

Introduction

Club foot also called congenital talipes equinovarus (CTEV), is a congenital deformity involving one or both feet. The affected foot looks like it has been rotated internally at the ankle. Approximately half of people with clubfoot have either single foot or both feet involved, which is called bilateral club foot. It occurs in males twice as frequently as in females. Prevalence of club foot is about one in every 1,000 live births¹.

Clubfoot has from long been an unsolved clinical challenge for the orthopedic surgeons. The problem is more serious in the developing countries on account of late presentation; higher rate of dropouts (of treatment) and superstitious beliefs attached to this congenital problem especially in rural population. The superstitious beliefs are more common in lower socioeconomic group parents and causes lot of dropouts and inadequate treatment. To convince such parents is still a challenge.

There is lot of literature on management of club foot ranging from bandages by Hippocrates and plaster casts by Kite to surgical treatment and now back to non surgical Ponseti treatment with the final aim to achieve a functional, pain-free, plantigrade foot with good mobility and without calluses¹⁻². Previously nonsurgical management generally led to inadequate correction whereas those children who underwent surgery often developed extensive scarring of the soft tissues with often residual deformity and pain. But these complications have been never seen by those people who use Ponseti method of serial manipulation and casting²⁻³.

The Ponseti treatment for clubfoot deformity was introduced in North America in the late 1940s³⁻⁴ and has

become a primary treatment option more recently⁴. The method is based on anatomical studies which concluded that the key landmark in obtaining safe reduction of the deformity was the talar head. The deformity can be broken down into the four constituent parts –fore foot adductus, mid foot cavus, hind foot varus and equinus^{4,5,6}.

Aims and Objectives

The aims and objectives of our study were as follows:

Evaluate Ponseti management of club foot at secondary care center in rural population in lower socioeconomic group patients.

Methods

This study was prospective study which was conducted in Sub District Hospital Kreeri Baramullah. Our hospital is located on mountain top (Himalayan range) and mostly caters rural population with majority being in lower socioeconomic group patients whose only source of income is farming. Our study was conducted between July 2016 to June 2018. Formal ethical committee clearance was taken from hospital before conducting the study.

Patients were enrolled from both from inpatient and outpatient department of orthopaedics. Total number of 70 patients were enrolled for the study with 80 feet. 5 patients with unilateral club foot were lost to follow-up.

Inclusion criteria

All patients who were born with club foot in our hospital and whose parents gave consent to be part of study

Age less than one year at inclusion in the study.

Idiopathic clubfoot

Exclusion criteria

Parents who were not willing to be part of study.

Age more than one year.

Previously operated for club foot.

Relapsed / Resistant club foot earlier treated with other methods of plaster cast application, concomitant major illness, atypical or secondary clubfoot and unwillingness to take part in the study

A complete history and physical examination was done as per the protocol. Each club foot was scored as per Pirani scoring system and every time plaster was changed Pirani scoring was done. Severity scores for hind foot, mid foot and total score was done separately.

Plaster was applied in two stages in phases

Ponseti Tenotomy was done in Operation Theater in morning as first case under local anesthesia. No child required general anesthesia however anaesthetist was always kept available in theater during the procedure.

Stage I: Serial corrective casts were applied till complete correction of deformity was achieved

Stage II: (stage of bracing) with the aim of maintaining correction and preventing recurrence.

Statistical Analysis

Statistical analysis in our study was done by a statistician. All the Data was entered in SPSS 14 and analyzed. Variables were analyzed and correlations were made by using the mean, average, and Pearson's Chi C square/Fishers exact test. The statistical significance was set to be at p value <0.05

Results

A total of 70 children who met the inclusion criteria were enrolled

and managed by Ponseti method of treatment. (Table1)

Table 1: Sex distribution of patients in our study

Total	Male	Female
70	55 (78%)	15 (22%)

Male babies constituted majority of patients.

Table 2: Pattern of involvement of club feet

Total no of CLUB feet	Unilateral	Bilateral	Lost to follow up
70	55	10	5

A total of 70 club feet were enrolled in the study 55 had unilateral club feet and 10 had bilateral involvement and five were lost to follow-up hence excluded from the study (table 2). Majority of patients in our study had unilateral club foot deformity.

Table 3: Mode of deliveries

Total	Institutional deliveries	Home deliveries
70	40	30

Out of total 70 patients 40 were new born babies who presented immediately after birth and 30 patients presented at an average of 5 months after delivery usually conducted at home by dais.

Table 4 :Final results of the Ponseti casting technique

Presentation	Total	Complete correction	Recurrence
Early presenters	40	39	1
Late presenters	30	27	3

Image 1 : Group of kids undergoing Ponseti treatment in our hospital



There was wide variation in age of patients who underwent Ponseti management for correction of CTEV (Image 1).

40 cases presented within 1st week after delivery whereas 30 patients reported to our department at an average of 4 months after delivery. Average no of plasters applied to achieve complete correction in patients who presented early ranged from 5-7 whereas in late presenters average no of Ponseti casts application ranged from 10 -14. Reason for increased number of casts for late presenters was late start of Ponseti treatment in this group.

Ponseti Tenotomy was required in 36 patients (90%) in early presenters whereas all 30 (100%) patients who were late presenters required Ponseti Tenotomy.

The average duration of follow-up was 19.5 months (range 6–32 months).

All the observations regarding severity assessment were grouped into two groups one being the

Recurrence was seen in one case of early presenters and 3 cases in late presenters. All recurrences were treated with initial casting which did not yield satisfactory results and finally were treated with JESS with good results.

Image 2,3 and 4: A case of 8 months old baby with bilateral CTEV

Image 2,3,4 showing serial correction after ponseti management



Image 3 : B/L CTEV before application of first ponseti cast



Image 3: After application of first cast



Image 4: After application of fifth cast

Image 5, 6: small baby undergoing Ponseti Tenotomy with full correction at the time of Tenotomy and achieving good dorsiflexion after tenotomy



Image 5

Image 6

Image 5: less than 5mm incision of percutaneous Ponseti Tenotomy Image 6 showing full dorsiflexion after Ponseti Tenotomy.

After Ponseti Tenotomy ponseti cast was applied for 3 more weeks followed by foot abduction orthosis. Which was continued for 23 hours a day till patient started crawling after crawling stage abduction brace (image 7) was applied during night and AFO during day.

Image 7 foot abduction brace



Image 8: 3 weeks after Ponseti Tenotomy and application of foot abduction brace



Patients were counseled properly about use of foot abduction brace and regular follow up (image 8)

Poor compliance with use of brace is a major issue especially in children coming from lower socio-economic group and where the parents education level was poor. Attendants were made to understand importance of splint in maintenance phase and frequent need to change splint for proper fit.

Image 9: 18 months old baby with full correction after Ponseti treatment



Discussion

Ponseti treatment for clubfoot has been gaining in popularity due to the good results demonstrated by Ponseti and other institutions⁷. Apart from the Achilles tenotomy, which is considered an integral part of the treatment, surgical intervention rates are low.

In our study all serial Ponseti casting was done in Ponseti clinic without use of any sedation or anaesthesia which is in accordance to original Ponseti method of treatment of club foot⁸.

The patients treated at secondary care centers do better once treatment

is started only issue being extra counseling. The only limiting factor being little trained staff present at peripheral hospitals who can apply Ponseti cast while in tertiary care centers ample staff is being present in the hospital for managing Ponseti clinics.

However if these patients are referred to tertiary care centers they are usually lost in followup because of monetary issues in travelling long distances to reach the hospital final end point being lost to follow-up and inadequate treatment

The problem of club foot is more serious in the developing countries especially in peripheral areas on account of late presentation; dropouts (of treatment) and superstitious beliefs attached to this congenital problem. However if attendants are properly counseled on every visit dropout rate is almost nil.

Although 92-98% successful short-term results has been reported for the treatment of idiopathic clubfoot with Ponseti method, documentation of the long term results of the technique especially in peripheral hospitals and secondary care centers needs further studies⁹⁻¹¹.

Conclusion

The aim of this study was to ensure that the Ponseti method was safe and effective in the early stages of correction of clubfeet even at peripheral hospitals. Only issue being extra counseling required for attendants who are usually poor and no avenues to get their kids treated at tertiary care centers

Immediate counseling by trained nurses at first contact should be part of treatment in motivating couples with club foot born child to start treatment in nearest hospitals and maintaining of

register for regular follow-up.

So a Combined care between orthopaedic and respective departments handling club foot patients has a great positive impact on overall management of club foot.

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