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Research Article

Frequency of Psychosocial Impact on Parents of Children Undergoing Ponseti Treatment for Clubfeet, with Special Reference to Compliance to Foot Abduction Bracing

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Abstract

Introduction: Clubfoot, is one of the commonest deformity among congenital and developmental musculoskeletal deformities, that responds best to gold standard Ponseti treatment to achieve pain free, supple, callosities free, normal feet. The success of treatment in fact depends on strict compliance to protocols of its lengthy phase of bracings to maintain correction. The study is aimed to asses the psychosocial impact of Poseti treatment with use of foot abduction brace on patient and the family.

Patients and Methods: This cross-sectional study was carried out clubfoot clinic of the department of Orthopedics, Jinnah Postgraduate Medical Centre, Karachi, Pakistan. Study includes 105 Parents of either gender, aged 20 - 60 years whose children having idiopathic congenital typical clubfeet, aged < 12 years, undergoing Ponseti treatment for more than three months were included. The study duration included June to December 2018. Those accompanying the child but not any one of parents, those having a treatment failure previously, or those not giving consent were excluded. Parents were interviewed regarding their basic demographics including soci-economic status and questions related to compliance to use of foot abduction brace. Modified Orthotics Prosthetics User Survey for satisfaction including 10 questions from the Parent bracing satisfaction survey to assess favorable psychosocial impact. Stratification was done through chi-square test and p-value ≤ 0.05 was taken as significant.

Results: Out of 105 participants 84 (%) were male, with mean age was 39.72 ± 12.10 years. Mean duration of treatment was 8.27 ± 2.49 months. Favorable psychosocial impact was observed in 70.4% patients. The results showed that there was a significant association of outcome with employment status and education. While no significant association was found with gender, age, duration of treatment, ethnicity and financial status.

Conclusion: Ponseti method is the most cost-effective intervention in clubfoot management. Its effectiveness is mired by various challenges major being compliance with protocol of bracing phase treatment. The study highlights the frequency of psychosocial impact among parents, patients and found significant association with parents education and economic status.

Keywords: *Psychosocial Impact; Parents; Ponseti Casting; Foot Abduction Brace; Clubfoot*

Introduction

The prevalence of babies born with congenital clubfoot deformity at Pakistan is within reported ratio of 1% - 3% per live births as in the developed world [1,2]. The clubfoot is having a multidirectional structural deformity with essential features of C.A.V.E. (Cavus, Adductus, Varus and Equinus) [3]. The complexity of its deformity makes it little difficult technically to achieve best long term results to achieve a normal growing foot [3,4]. In spite of having an uncertain pathogenesis and complexity of its deformity, this anomaly is completely manageable, without a surgery to achieve excellent results of normal growing feet [5,6]. Today it is treated worldwide with a gold standard methodology introduced by Ignacio V Ponseti, who quotes that surgical correction is not a good choice of treatment for clubfeet, the feet become rigid, stiff, weak, painful and child is not able to use normal shoes [1,4,7]. The literature reports Ponseti technique having excellent long term results, with some patients following up even to their fourth or fifth decade [7-9]. However, if maltreated or untreated as used to be in our community or inadequately treated due to noncompliance to bracing, it leads to a significant personnel morbidity and Psychsocial negative impact. That includes a physical handicap with inability to perform basic activities, a social stigma and family dependence. All these factors have a remarkable psycho-social and economic burden on parents and the community [10,11].

Hence, it become essential on part of treating physician to counsel the parents at outset, to explain the complexity of the problems, methodology of treatment including bracing phase and difficulties they might have to face. That shall minimize the surprise factor and cope up with the strong psychological impact that develops by this long-term commitment [12]. They should be taken in full confidence about the outcome of the treatment and for this task usually, a multidisciplinary team is required. Studies have shown that parents go through various emotional disturbances after the diagnosis and treatment that may further, has the potential to harm the neonate/infant [6,13]. The relapse and recurrence in almost half the cases during bracing phase treatment of four years has been referred to the noncompliance to strict protocol and failure to get a timely treatment for early relapse [4,14-16].

Since braces may be a social taboo and costly to procure for majority in our socioeconomic step, it is important to determine the favorable psychological impact and promotes its acceptability among parents. That shall in turn increases adherence, compliance, and ultimately the success rate of treatment. The current study is planned to determine the favorable psychosocial impact on parents of children undergoing Ponseti treatment for clubfoot. The results shall be another too to increase the awareness regarding favorable psychosocial impact and to decrease ratio of non-adherence to treatment specially the foot abduction brace.

Patients and Methods

This cross-sectional study was carried out clubfoot clinic of the department of Orthopedics, Jinnah Postgraduate Medical Centre, Karachi, Pakistan, the duration included June to December 2018. The study commenced with prior approval from institutional review board and a written informed consent from parents. Study includes 105 Parents of either gender, aged 20 - 60 years whose children aged < 12 years, having idiopathic congenital typical clubfeet, undergoing Ponseti treatment for more than three (Six) months were included. The guardians accompanying patients but not any one of parent, those having a treatment failure previously, or not giving consent were excluded. Parents with patients with atypical, syndromic and post surgical clubfeet were also excluded. All their patients used IOWA foot abduction brace or Dennis browne shoe splints after achieving correction with Ponseti technique of serial manipulation and casting for 6 - 8 cast and a percutaneous Achilles tenotomy as per protocol. Parents were interviewed regarding their basic demographics, socioeconomic status, compliance to wear braces and problems faced by using that. We used a modified orthotics prosthetics user survey (OPUS) for satisfaction that included 10 questions from the Parent bracing satisfaction survey [10]. All volunteers had their questionnaires interviewer-administered due to their limitation of understanding in the technical terms used. Complete questionnaires were retrieved immediately by the researcher. Outcome variable i.e. favorable psychosocial impact was assessed and results were noted in proforma.

Data were entered analyzed using SPSS for Windows, Version 16.0 (IBM, Armonk, New York, US). Mean ± standard deviations were calculated for the continuous variable like age of parent and duration of treatment. Results on categorical variables of gender, ethnicity,

financial status, education, and outcome variable i.e. favorable psychosocial impact were expressed in frequency and proportions. Stratification of age, gender, ethnicity, financial status, education, employment status, and duration of treatment was done to see the effect on the outcome variable, assuming the P-value ≤0.05 as significant. Chi-Square was used to detect the difference.

Results

Out of 105 Participants 84 (%) were male, with mean age was 39.72 ± 12.10 years and mean duration of treatment was 8.27 ± 2.49 months. The age was further stratified into two groups with 53% <40 years of age and the rest > 40 years. When financial status was enquired, most of them had a middle level of income. Different ethnicities were found in the study population with most (%) of them being Punjabis as shown in table 1. Majority (%) of registered parents were employed and unlike what was expected, many (%) of them were fairly educated (Table 1). The overall mean duration of treatment of study subjects was 8.27 ± 2.49 months. 61 (53%) patients received treatment for ≤ 6 months and 54 (47%) for > 6 months duration.

Characteristics	Frequency (n)	Percentage (%)
Age groups		
≤ 40 years	61	53
> 40 years	54	47
Financial Status (according to Pakistani rupees)		
Poor income (< 20,000)	30	26.1
Middle income (20,000 - 50,000)	66	57.4
Upper income (> 50,000)	19	16.5
Ethnicity		
Urdu Speaking	14	12.2
Sindhi	25	21.7
Pathan	29	25.2
Punjabi	34	29.6
Baloch	13	11.3
Employment status		
Employed	79	68.7
Unemployed	36	31.3
Education		
Postgraduation	8	7
Graduation	19	16.5
Intermediate	22	19.1
Matric	37	32.2
Primary	22	19.1
Uneducated	7	6.1

Table 1: *Distribution of patients according to sociodemographics.*

Table 2 shows the frequency distribution of response by the parents, to study questions about the psychosocial impact in relation to use of foot abduction braces. The majority N (70.4%) of the participants responded with favorable psychosocial impact that is further elaborated in figure 1.

Questions	Response	
	Yes * n (%)	No n (%)
The brace fits well	83 (72.2)	32 (27.8)
The weight of the brace is manageable	88 (76.5)	27 (23.5)
The brace is easy to put on	112 (97.4)	3 (2.6)
The brace looks good	86 (74.8)	29 (25.2)
The brace does not affect clothing	101 (87.8)	14 (12.2)
Skin is free of abrasions and irritations	93 (80.9)	22 (19.1)
The child seems free of pain when the brace is on	92 (80)	23 (20)
We can afford to purchase this brace	80 (69.6)	35 (30.4)
We can afford to repair or replace this brace as needed	93 (80.9)	22 (19.1)
I know other braces that are better	85 (73.9)	30 (26.1)
The child wears brace more than 12 hours	61 (53)	54 (47)
Does the child wear braces during social gatherings	76 (66.1)	39 (33.9)
Whether the cost of treatment is bearable to family	69 (60)	46 (60)
How much are the costs? Less than 1 lac (yes) or more than a lac (no)	65 (56.5)	50 (43.5)

Table 2: *Frequency distribution of questions about favorable psychosocial impact (n = 115).*

**Yes will be labeled as positive.*

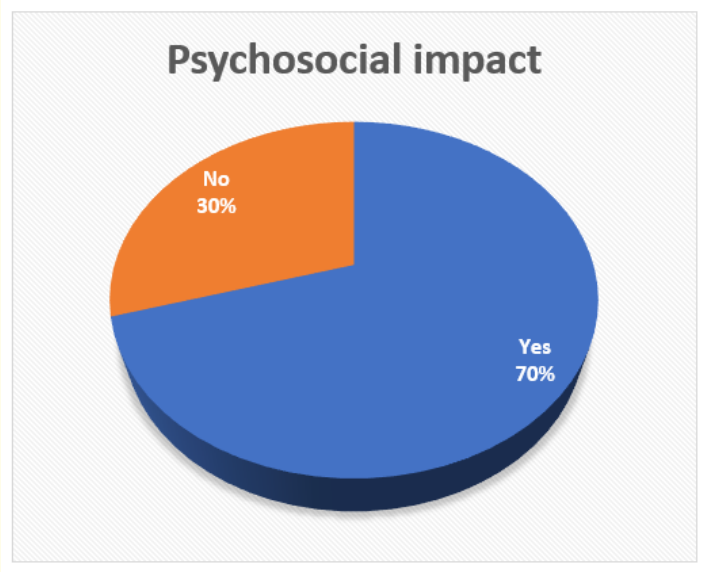

Figure 1: *Distribution of favorable psychosocial impact (n = 115).*

Table 3 refers to the stratification with respect to gender, age, duration of treatment, ethnicity, financial status, employment status, and education, that was done to observe the effect of these modifiers on the outcome (favorable psychosocial impact).The outcome revealed a significant association of outcome with employment status ($p < 0.01$) and education ($p < 0.01$). While no significant association found with gender ($p = 0.592$), age ($p = 0.104$), duration of treatment ($p = 0.311$), ethnicity ($p = 0.381$), and financial status ($p = 0.119$).

	Favorable psychosocial impact		Total	P-Value
	Yes (n = 81)	No (n = 34)		
Gender				
Male	58	26	84	0.592
Female	23	8	31	
Age group				
≤ 40 years	39	22	61	0.104
> 40 years	42	12	54	
Duration of treatment				
≤ 6months	21	12	33	0.311
> 6 months	60	22	82	
Ethnicity				
Urdu Speaking	13	1	14	
Sindhi	17	8	25	0.381
Pathan	19	10	29	
Punjabi	23	11	34	
Baloch	9	4	13	
Financial Status				
Poor	17	13	30	
Middle	51	15	66	0.119
Upper	13	6	19	
Employment status				
Employed	48	31	79	0.001
Unemployed	33	3	36	
Education				
Post-graduation	6	2	8	
Graduation	12	7	19	
Intermediate	11	11	22	0.000
Matric	23	14	37	
Primary	22	0	22	
Uneducated	7	0	7	

Table 3: *Association of favorable psychosocial impact with other characteristics (n = 115).*

Discussion

The complexity of clubfoot deformity, and its pathogenic gene which remain active till 4 years of age [1], brings a wide spectrum of problems in terms of management and Psycho-social impact on parents and the treating surgeon as well. That require a persistent, careful adherence to protocol of treatment with nonoperative treatment methodology, the gold standard today being with Ponseti protocols of treatment. Ponseti., *et al*. reported satisfactory outcome of initial correction rates as high as 98%, with a reported range of 92% - 100% following a strict adherence to protocol [7,16,17]. The rate of satisfactory outcome declines as the treatment with maintenance phase

continued over to 4 years. The actual challenge thus does not definitely lie in the manipulation and casting but maintenance correction with abduction bracing that must be comfortable and acceptable child and family as well. Here comes the patience and compliance on the part of parents, that decides the success and failure of treatment [8,12,16]. Bhatti A., *et al*. [2] and Memon I., *et al*. [11] in a local study found xx% satisfactory (excellent to good) results that are comparatively lower than literature published from west [7,16-17]. That lower rate of success has been referred to mostly combination of younger with older age children summed as a one group under evaluation and other factors related to parents' literacy, cultural barriers, non-affordability. Other factor for low rate of success elaborated by Bhatti., *et al*. [2], may be the experience of treating surgeon compared to inexperienced trainees doing casting. Tindal., *et al*. [19] however, suggest to ignore the factor of experience on the cost of simplicity, excellent success rate and low demand with Ponseti technique and recommend as the best treatment for developing world.

Multiple studie [2,10,11,18-22] have elaborated the effect of cultural, economic factors and social taboos on the outcome of Ponseti treatment of clubfeet. Bhatti., *et al*. and Eftekhar., *et al*. [2,11,20] also refers non-affordability and misbelief on gypsona cast that might burn skin that compel low socio-economic parents to get treatment from easily approachable bone setters. That usually result to development of rigid clubfoot deformity. Ultimately these children to go either for an extensive surgery or being left as such without further treatment. However, the affording and literate ones do get treatment as early as possible as they are more aware of development of disability among disability if treated late [2,11]. The current study as well highlight the psychosocial impact as significantly higher amongst employed, fairly literate and with average financially affordable parents. Our study indicates favourable psycho-social impact in 70.4% of parents of children treated with Ponseti protocols of foot abduction bracing that too is similar to reported ratio of 70.5% multiple studies [14-16].

Limitation of the Study

The limitation of our study being an observational study and did not randomize patients and is conducted in a single location with a small sample size in an urban environment. Therefore, the results might not be generalizable to larger populations.

Conclusion

Ponseti method is the most cost-effective intervention in clubfoot management. Its effectiveness is mired by various challenges major being compliance with protocol of bracing phase treatment. The study highlights the significant psychosocial impact among parents, patients and found significant association with parents education and economic status.

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