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Ponseti Method or Kite Method: Which is More Effective for Clubfoot Treatment? A Descryptive Study, Conducted in Orthopaedic Service in Tirana

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Abstract: ***Introduction: Pes Equinovarus is a congenital pathology. It is seen for the first time in Egyptians' paintings and first described in medical literature by Hippocrates 400 years BC. In our country, times ago, the treatment of clubfoot is based on Kite's descriptions (1939), which consist only in serial manipulation with cast making gradual corrections. While recently from 2010 till now we are using Ponseti method (developed since 1950) which consist in manipulation with cast and a mini-operative surgery called Achilles tenotomy. Materials and Methods: This is a prospective randomized trial which is conducted in a tertiary hospital center in Albania. We have study clinical charts from January 2011 till December 2011. The study included 49 patients (76 feet) who had been diagnostic with congenital idiopathic clubfeet.). Out of 49 patients (76 feet) were 29 male and 20 female. The statistical package which is used is SPSS 20. Accepted error is less than 5 % (p < 0.05). Results: From 29 males (45 clubfeet: 8 right, 5 left,16 bilateral) and from 20 females (31 clubfeet: 4 right,5 left, 11 bilateral). Twenty-seven of our patients had bilateral clubfeet (or 54 feet) while twenty-two had unilateral pathology. The p-value is < 0.05 which mean that there is a significant difference between the Kite and Ponseti method in favor of Ponseti method. Number of failures in Kite group was 8 (21.1%) and only 3 (7.9%) in Ponseti group.***

Keyword: Ponseti method, Kite method, casting manipulation, time of correction

1. Introduction

Pes Equinovarus is a congenital pathology. It is seen for the first time in Egyptians' paintings and first described in medical literature by Hippocrates 400 years BC. He supposed that treatment should begin as soon as possible after birth [1].

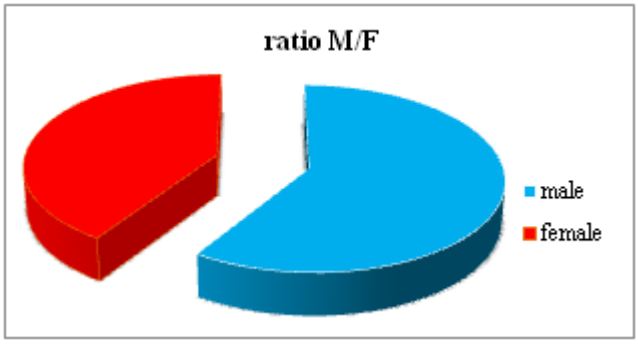
Researchers and various studies show that when clubfoot as pathology detected early, treatment should be conservative [2]- [4]. The treatment of clubfoot is serial and gentle manipulations with cast. Which will be able to stretch the contractures but in the same time to correct the anomaly of foot. The treatment' goal is to achieve functional, normal, pain-free foot and return it in good mobility [5]. In our country, times ago, the treatment of clubfoot is based on Kite's descriptions (1939), which consist only in serial manipulation with cast making gradual corrections[6]. While recently from 2010 till now we are using Ponseti method (developed since 1950) which consist in manipulation with cast and a mini-operative surgery called Achilles tenotomy [7]. This study is undertaken to compare this two methods and to distinguish what is best in the treatment of clubfoot.

2. Materials and Methods

This is a prospective randomized trial which is conducted in a tertiary hospital center in Albania. We have study clinical charts from January 2011 till December 2011 from statistic department of Service of Orthopaedic and Traumatology " Prof Dr. Panajot Boga". The study included 49 patients (76 feet) who had been diagnostic with congenital idiopathic clubfeet. In this trial has been excluded children with spastic or paralytic clubfoot. The age of onset of treatment is divided into three groups (0-3 months, 3.1-6 months, 6.1-9 months). After we take the consent from the parents of the children with clubfoot, we randomly divide the patients in two groups. So, 38 feet were treated with the Kite method and the other by Ponseti method (this division of feet treatment was randomized). Out of 49 patients (76 feet) were 29 male and 20 female.
The statistical package which is used is SPSS 20. Accepted error is less than 5 % (p < 0.05).

3. Results

During January 2011 till December 2011 in our service are treated 49 patients with clubfoot.



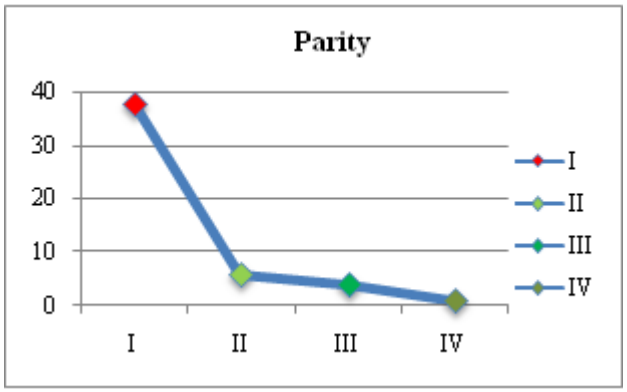
Graph 1: shows the ratio between males and females.

So, 29 of them are male and 20 female and the ratio of male/ female is approximately 1.5/ 1. From 29 males (45 clubfeet: 8 right, 5 left,16 bilateral) and from 20 females (31 clubfeet: 4 right,5 left, 11 bilateral). Twenty-seven of our patients had bilateral clubfeet (or 54 feet) while twenty-two had unilateral pathology.

Table 1: Some data collection.

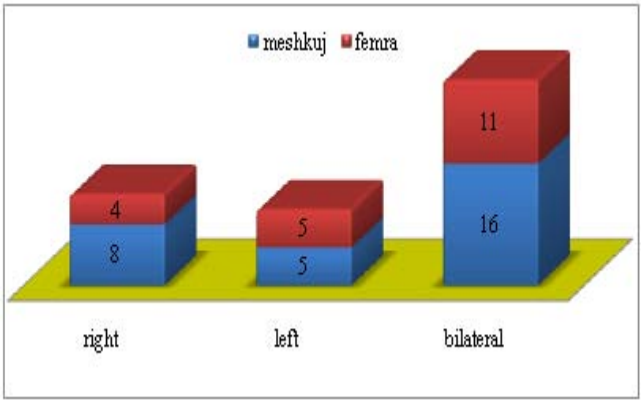
Year	No. of cases	Parity				Sex		Right		Left		Bilateral		No. of feet	
		I	II	III	IV	M	F	M	F	M	F	M	F	M	F
2011	**49**	38	6	4	1	29	20	8	4	5	5	16	11	45	31

By analyzing this table we see that the clubfoot as a congenital pathology is most frequent during the first pregnancy and less in subsequent pregnancies as it shows in the graph below:



Graph 2: The frequency of clubfoot according parity.

This graph shows that children born from the first pregnancy of their parents are more likely to develop clubfoot. So 38 (77.6 %) have born form the first pregnancy of their parents, 6 (12.24 %) have born in the second pregnancy, 4 (8.2 %) have born in the third pregnancy and 1 (2 %) is born in the fourth pregnancy.



Graph 3: The frequency of clubfoot. Ratio M/F

As we see in the graph above, in this study we have much more males than females and bilateral clubfoot also.

Table 2: Results of the two study groups

		Kite method	Ponseti method
No. of feet		38	38
Age(month) Mean ± SD		0-9 month 32.25 ± 27.4	0-9 month 31.75 ± 25.4
Laterality	R	7	5
	L	5	5
	B/L	13	14
No. of casts Mean ± SD		5-24 10.71 ± 5.4	5-13 6.2 ± 2.3
No. of feet corrected		30 (78.9%)	35 (92.1%)
No.of faliures		8 (21.1%)	3 (7.9%)

The p-value is < 0.05 which mean that there is a significant difference between the Kite and Ponseti method in favor of Ponseti method. We see that the time that take to heal the clubfoot with Ponseti method is less than with Kite method. Also in the group which are treated with Kite method are much more cases which needed relapses and uncorrected feet. This is better shown in the table 3 below.

Table 3: The table below show the correlation of Kite and Ponseti methods in correction of congenital clubfoot. *p< 0.05

Dimeglio score	No .of feet	Feet corrected	No.of casts mean ± SD	Relapses	Uncorrected feet
Kite					
Moderate	2	2	6.1±0.1	-	-
Sever	9	9	6.69±2.34	4	1
Very sever*	27	16 (59.3 %)	12.81±5.6	8	7
Total	38	27	10.93±5.7	12	8
Ponseti					
Moderate	3	3	3.65±1.1	-	-
Sever	16	15	6±2.1	5	1
Very sever*	19	17(89.5 %)	6.89±2.4	4	2
Total	38	35	6.3±2.42	9	3

In our study the follow-up in the Kite group was 20 to 36 months, and in the Ponseti group was 17-31 months.

4. Discussion

Congenital Pes Equinovarus (clubfoot) it is a anomaly that can be meet to newborns. The incidence of this congenital anomaly goes from 1-2 per thousand births [8]. In our period of study, we had 49 patients and 76 feet (which mean that not all patients had both feet with this anomaly), from which 27 or 55.1 % patients were bilateral, 12 or 24.5 % right and 10 or 20.4 %left. So, 54 -71.1 % feet were bilateral,12-15.8 % right and 10-13.1 % left. 59.2 % in this study was male and 40.8 % female. Many of these children (77.6 %) were born from the first pregnancy of their parents.

The mean age of treatment was 14 to 21 days after postpartum which means that if the treatment starts early postpartum newborn, clubfoot correction takes less time to return to normal[9], [10].
Because we used two methods in the treatment of our young patients diagnosed with clubfoot, it was evident that the Ponseti method was more successful than Kite method. This results are evident even in other studies [11]- [13]. So in the end we use Ponseti method in our hospital till 2010. I hope that in the future, I would like with my team to analyse long-term results.

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