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Awareness of special children's parents about pes planus-cross sectional survey

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Abstract
Introduction: Paediatric pes planus is a common treatable problem seen in special school going children that can be managed with early intervention. However, there is lack of parental awareness regarding pes planus, which can delay treatment. This study aimed to assess the special school going children's parents' awareness of pes planus and knowledge regarding its predisposing factors and importance of footwear modification in early childhood.
Materials and methods: This study is cross sectional one time survey carried out on 54 special schools going children between 5-16 age groups. Navicular drop test was performed to assess medial arch of foot. Pre validated questionnaire was used to conduct interview of parents having positive pes planus. Post study, total percentage of parent's awareness regarding existence pes planus in their child, predisposing factors and footwear modification were calculated by statistical analysis. Weighing scale, Height measuring scale, Ruler, Marker, Pre validated questionnaire these were material used during study.
Results: By the end of the study, 72.22% of total population showed positive Navicular drop test .In this survey, 82% parents were unaware about pes planus. 62% of total pes planus children were obese. Parents were unaware about following predisposing factors, obesity (79.16%), genetic factors (87.17%). While 79.48% were not aware of footwear modification.
Conclusion: Results show that there is low parental awareness regarding predisposing factors and early intervention. Spreading Awareness in special school going children parents about pes planus is important to prevent further foot deformity and Gait deviations.

Keywords: paediatric pes planus, special school, awareness, obesity, footwear modification

1. Introduction

Deformities of lower limb are very common in children having lack of Neuromuscular control like cerebral palsy, Down's syndrome, autism etc [1, 2]. Pes Planus (Flat foot) is one of the commonest problems amongst them, when they start weight bearing. As these children start walking generally it lead to gait disorders [3]. Flat foot can be defined as 'a sagging of the medial arch and heel valgus or Flattening of the medial arches [3]. Arches start developing and fat pad which is present underneath the medial longitudinal arch in neonatal and toddler resolve at the age of 2 to 5 years [4]. Paediatric flatfoot can be divided into flexible and rigid categories. Flexible flatfoot is characterized by a 'normal arch during non-weight-bearing and a flattening of the arch on stance which may be asymptomatic or symptomatic'. Rigid flatfoot is characterized by a 'stiff, flattened arch in both weight bearing and non-weight bearing positions [5, 6]. Most rigid flatfeet are associated with underlying pathology that requires special considerations. Many clinical factors are responsible for developing flat foot such as generalized ligamentous laxity, neurologic and muscular abnormalities, genetic and collagen disorder [7]. Some other predisposing parameters are age, sex, body composition, family history, types of footwear [7]. Males are twice more prone to have flatfoot as females [8, 9]. Obese and overweight children are more likely to have flatfoot than those with proper weight [4, 8]. For children and teens between 2-20 years of age BMI is age and sex specific. During growth and development, weight and height changes, as does their relation to body fitness [10].

Numerous methods are available for assessment of flatfoot based on footprints [8, 11, 12, 13], heel-to-arch width ratio [14], subjective assessment [15, 16]. Radiographic measurements [17, 18]. Navicular Drop test is one of the objective methods for assessment of flat-foot. The prominent navicular bone generally represents the highest point of the MLA to the supporting surface [19, 20]. Navicular drop involves locating the navicular tuberosity on the non-weight-bearing foot and 50% weight bearing on the foot and then sagittal plane excursion of the navicular bone is measured by a ruler [9, 19]. Flexible flatfoot, most of the time remains asymptomatic till adulthood. Current evidence suggests that it is safe and appropriate to simply observe an asymptomatic child with flat feet. Painful flexible flatfoot may benefit from, physical therapy, footwear modification, orthopaedic intervention or even a surgical procedure [21]. In early paediatric age group, parents of special children are concern more towards neuromuscular problems like delayed millstones, sensory problems, poor nutritional growth, low IQ level and other musculoskeletal problems and thus parents are less aware of flatfoot and its consequences on static and dynamic functional abilities. Therefore, the study aim is towards understanding awareness in special school children's parents regarding flat foot, predisposing factors and guidelines for corrective majors in early age.

Aim

Aim-To understand awareness in parents of school going special children about Pes planus, footwear modification and predisposing factors of pes planus.

Objectives

1. To finds out awareness of parents about flexible pes planus
2. To find out awareness of predisposing factors like Body mass index, Genetic history of pes planus.
3. To find out awareness of parents about footwear modification as a early conservative management.

2. Materials and methodology

2.1 Materials and Methods

1. Weighing scale.
2. Height measuring scale.
3. Ruler.
4. Marker.
5. Pre validated questionnaire.

2.2 Methods and Methodology

Study design

Cross sectional survey.

Sampling method

Convenient sampling.

Sample size

54 (students of 6 special schools under Panvel Mahanagar Palika)

Duration of study

One time survey.

Potential participants were eligible if they

Inclusion Criteria

1. Special School attending children above 5 years of age.
2. Children having neuromuscular disorders.

Exclusion Criteria

1. Children with other deformities of foot
2. Children with footwear modification
3. Students above 16 years of age.

2.3 Methodology

The study was conducted on children of 6 special schools of navi Mumbai districts. This study is cross sectional survey carried out on 54 children of panvel mahanagar palika schools. The study procedure for this study was as follows. Permission was taken to conduct parent's interview and assessment of children from Principles of schools under Palika Mahanagar palika. Demographic details such as age, gender of students were recorded and also weight and height was taken to calculate Body mass index for each student. Weight was taken with weighing scale and height was taken with Height measuring scale. After BMI is calculated for children, it is expressed as a percentile which can be obtained from standard American Academy of paediatrics specific for age and gender. After that navicular drop test was performed to assess medial arch of foot. For checking navicular Drop test, the subject was first positioned in standing i.e. weight bearing position. Using a small rigid ruler, the height of navicular bone was measured from the floor to the most prominent part of navicular tuberosity when in the neutral talar position. Again the height of the navicular bone is measured in sitting position from ground i.e. non weight bearing position. The difference in measurement is the navicular drop and drop >/=10 mm will be regarded as pes planus. Pre validated questionnaire was used to conduct interview of parents to find out their knowledge regarding flat foot, effect of obesity on development of flat foot, hereditary predisposition of flat foot, footwear modification as an early conservative treatment. Post study, Percentage of parental awareness regarding flat foot, predisposing factors like obesity and genetic history and knowledge of footwear modification as an early conservative treatment were statistically analyzed.

3. Results

Table 1: Demographic Data

Age group	5-10 age group	11-15 age Group
%	43%	57%
Gender	Male	Female
%	76%	24%

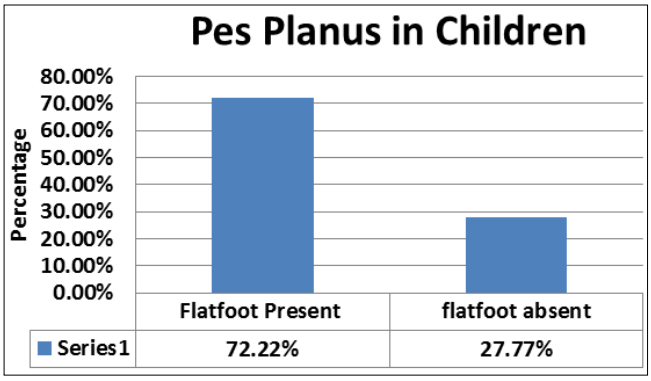

Fig 1: Total no of children with pes planus using Navicular drop test

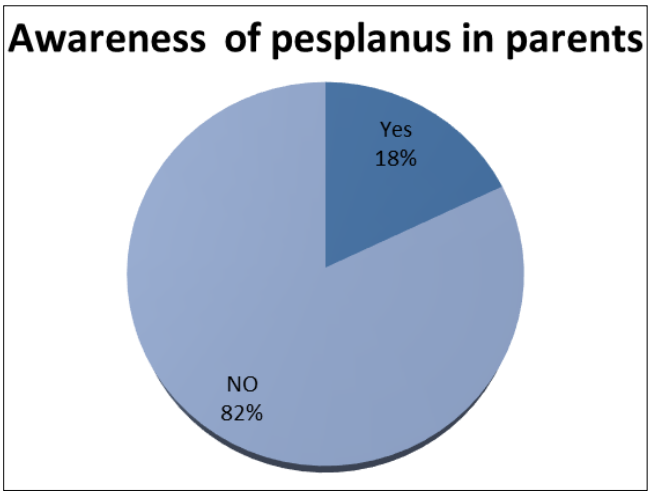

Fig 2: Awareness of Pes planus in own children

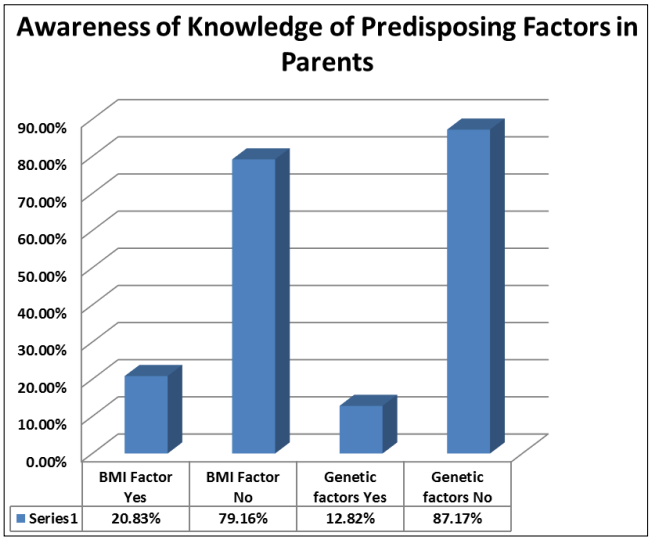

Fig 3: Awareness of knowledge of predisposing factors of pes planus in parents. (BMI, Genetic)

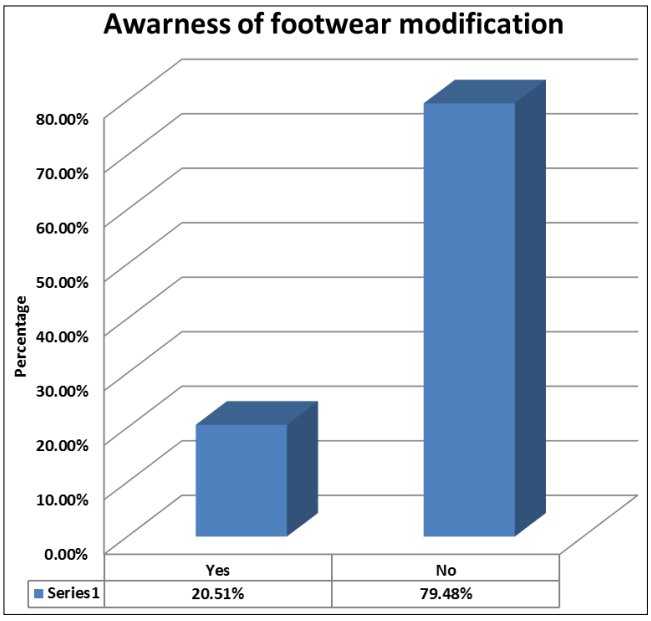

Fig 4: Awareness of conservative treatment (Footwear Modification) in parents.

4. Discussion

In this current study parents of special school going Autistic, Cerebral palsy, Down's syndrome were selected after taking their demographic data of age and Gender.

Post questionnaire survey it has been observed that most of parents 82% are not aware of presence of flat foot in their child.

As per the literature, parents of children with neurological problems consult orthopaedics more for other deformities like genu varum or valgum, hip Deformities, scoliosis, kyphosis in an early age of Children.

Foot is base foundation for skeletal maturity. As the arches decreases in paediatric patient, bodyweight is transferred to more towards medial side of foot when child starts standing or walking. Flatfoot therefore causes problem in static alignment of foot, ankle and dynamic functional abnormality in lower limb.

Childhood neglected pes planus can also leads to intermittent lower back pain, hip pain, anterior knee pain, joint degeneration, instability and functional limitations and/or disability [22]. and also Gait Deviations in their adulthood.

Parents of special Child are not aware of all this consequences of pes planus and not consult to doctors or physical therapist in early age of child.

Early intrinsic muscle strengthening, mobility exercises of tarsal and metatarsals and ankle as well as footwear modification like medial longitudinal arch support are some of physical therapy interventions could have been used if parents would have noticed this pes planus in early age of child.

Some literature also observed early age obesity is also important predisposing factor for pes planus in child [4, 8, 9]. In this study it has been observed that 79.16% parents were not aware about this factor for pes planus. Early awareness of parents about association of obesity with pes planus has great importance [23]. Physical therapist can educate parents and plan some weight reducing exercises as well as guide them for diet modifications.

In literature it has been also observed that Genetic history is also one of the predisposing factors of pes planus. In this study 87.1% parents were not aware of this factor. Early awareness of these factors especially in special school going children parents would help them to monitor foot changes periodically in their child if they have positive genetic history of pes planus.

It has been observed that majorities of orthopaedics have preferred conservative treatment in case of pes planus rather than surgical correction. In this study 79.48 % parents were not aware about footwear modification as a conservative approach for pes planus correction. Footwear modification is cost effective treatment approach for parents of children with pes planus. In one study foot pain, foot functional index using plantar pressure and quality of life of pes planus patients was studied in three groups of internal footwear modification, external footwear modification and exercise prescribed group respectively.

In internal modification medial longitudinal arch support were placed inside the shoe. In the external shoe modification Thomas heel was given. In the third group only an exercise program was prescribed. At the end of study clinical improvement were seen in group with internal modification of shoes [24].

Some Studies also shows that footwear modification also decrease in the level of displacement of the centre of pressure (COP) in flat foot children. It has been also observed that footwear modification also shows significant improvement in gait parameters likes symmetry of steps and walking speed [25].

Clinical Significance

this study will help physical therapist to spread early awareness in parents and caregivers of these special children by conducting small demonstration session on pes planus and its predisposing factors and also help physical therapist to conduct foot mobility and foot muscle strengthening and stretching classes for children in these schools. Physical therapist can also give advice to the parents about footwear modification by assessing every child in the school. Physical therapist can guide schools to conduct foot assessment camp on regular basis especially for children with neurological problems in their school.

Early parent as well as caregiver awareness about this intervention will prevent further deformities of lower limb,

spine and therefore gait deviation.

Limitation

- Sample size was small in this study.
- Children were not categorized depending on their neurological diagnosis

5. Conclusion

Results show that there is low parental awareness about pes planus in special school going children (Aware-18%) and also regarding predisposing factors (BMI-20.83%, Genetic-12.82%) and early intervention (Footwear Modification-20.51%). Spreading awareness in special school going children parents and caregivers about pes planus is important to prevent further foot deformity and gait deviations. This study will also be helpful for special school staff to conduct foot screening camp in their school as an early intervention.

6. Acknowledgement

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