

FOOT PRINTS

Comparison between Urban and Rural Young Females

Mahdi, S. A. Al- Jibbory and Mahmood, A. Al.-Jumaily
Nursing college, University Mosul

Abstract

Footprint in standing position were taken for 100 young females, 50 were from urban area and other 50 from rural area. The heel index and lateral deviation of big toe were measured. Footprint is simple test that can be done easily by medical or nursing staff. There is significant statistical difference between the two groups. This might be explained different life style and shoe wearing in the two communities. Flat foot and hallux valgus is less in young female in rural Iraqi community. The rural style of life in our community reduce the possibility of acquiring flat foot and hallux valgus.

Introduction

Standing footprints recorded in ink are used to assess foot deformities (Peterson 1998) . The term flatfoot applies when the apex of the arch has collapsed and the medial border of the foot is in contact (or nearly in contact) with ground (Peterson 1998, Solomon 2001).He flatfoot has a prevalence ranging from 7% to 22%(Peterson 1998,Solomon 2001,Cummings 1999). Hallux valgus is the commonest of the foot deformities. In people who have never worn shoes the big is in line with the first metatarsal. In people who habitually wear shoes the hallux assumes a valgus position; but only if angulation is excessive it referred to as hallux valgus(Peterson 1998, Solomon 2001, Cummings,1999).Hallux valgus is define as greater than 14 degree of lateral deviation of the hallux on the first metatarsal (Solomon ,2001). Flatfoot and hallux valgus is common conditions in the foot of young female, the relationship between them still controversial (Solomon ,2001).The aim of study is compare the footprints of young females in urban and rural area, as the foot development might have relation with life style.

Material and method

The footprint in standing position were taken for both foot to 100 young ladies, the foot print taken on method described by Stahili (Staheli ,1987).50 young ladies were from urban region, their age ranged between 18-22 (at entry of university); all of them were single, healthy, and had no musculoskeletal complaint. 50 young ladies were from rural area (Al-Gayarah which 60 km

south to Mosul), their age ranged between 18-22, all of them were single, healthy, and had no musculoskeletal complaint. The (heel index) ratio between the narrowest zone in middle of footprint and the widest area in heel were obtain for both foot (fig-1). We regard this ratio as simple assessment of foot arch collapse (Staheli, 1987).

The angle between the line between the most medial point of heel and forefoot, and the longitudinal axis of big toe were determined from footprint (fig-2). The angles were measured in both feet for all footprints. We regard this angle as simple assessment of valgus (lateral) deviation of big toe. The statistical test carried out by T test to measure the difference between two sample means. The correlation between the heel index and the angle of lateral deviation of big toe was tested by Pearson correlation test.

Result

The mean age, height, body weight and body mass index of urban group are (19.2 years, 1.55 m, 55.4 kg, and 22.96 respectively), while in rural group (19.4 years, 1.56 m, 55.01 kg and 22.62 respectively) (table-1). There is no significant difference between two groups (table-1). There are little difference for both feet in each person and no significance difference between right and left foot value, for this we take the mean for each person. The mean heel index of urban group is 0.603 with standard deviation 0.152; while in rural group is 0.55 with standard deviation 0.186. There is significant statistical difference between two groups at the level of 0.05; the absolute value for T calculated is 2.195 (table 1).

The lateral deviation angle of big toe in urban group is 9.5 degree with standard deviation 4.03, while in the rural group is 8.26 with standard deviation 3.08. There is significant statistical difference between two groups at the level of 0.05, the absolute value for T calculated is 2.432 (table-1). The correlation between the heel index and the angle of lateral deviation of big toe shows no significant differences. The r-value in urban group is (0.26), while in rural group is (-0.28).

Discussion

Footprint is useful in assessment of many foot deformities including hallux valgus and flatfoot, particularly to display pre- and postoperative changes (Peterson 1998). Footprint is a simple, inexpensive, noninvasive method in assessment of foot deformities and with no exposure to irradiation (Welton 1992). Feet print can also used in rapid survey for foot deformities, to aid clinical diagnosis, decision making, and follow-up (Welton 1992). Footprint is simple test that can be done easily by medical or nursing staff.

In our study the feet in the urban group tend to be more flat and the big toe more laterally deviated, there was significant difference between the two groups. The difference between the two groups might be explained by fact that: most of time the girls in rural area walk bar foot or with light slipper in home or in farm. They exposed more to sun and to mechanical effort, which might also share in better development of foot arch and big toe alignment. Girls in urban population spent most of time in home, and usually start she wearing earlier and for longer time in comparison with rural group. In other populations significantly higher rates of prevalence of flatfoot were noted among those who began to wear shoes in early childhood (Sachithanandam 1995). Flat foot was most common in children who wore closed-toe shoes, less common in those who wore sandals or slippers, and least in the unshod (Rao UB, 1992).

Obesity and joint laxity increase the incidence of flatfoot (Sachithanandam, 1995 , Rao UB ,1992).It is well known that foot arch type does correlate with the footprint (Chu WC ,1995) .Studies of normal children and skeletally mature individuals have identified the wide variations found in normal feet, a knowledge of which is fundamental to the interpretation of the footprint in the clinical situation (Welton, 1992) . We conclude that flat foot and hallux valgus is less in young female in rural Iraqi community comparison with urban community, which might be explained different life style and shoe wearing in the two communities. The rural style of life in our community reduce the possibility of acquiring flat foot and hallux valgus.

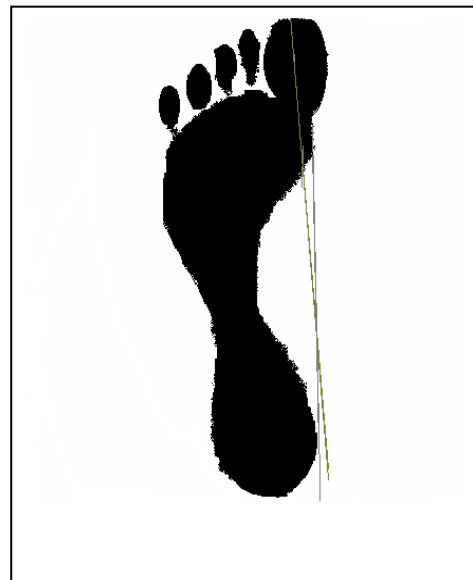
Table-1: Subjects variables and the mean, standard deviation of heel index and lateral deviation of big toe in foot print, with there T value and significance.

	Urban		Rural		t- value		significance
	Mean	Standard deviation	Mean	Standard deviation	calculated	tabled	
Age(years)	19.2	1.03	19.4	1.17	1.138	1.98	Not Significant (N.S.)
Height(m)	1.55	0.07	1.56	0.069	1.013	1.98	N.S
Weight(kg)	55.4	7.60	55.01	5.12	0.423	1.98	N.S
Body mass index	22.96	3.11	22.62	2.67	0.704	1.98	N.S
Mean of heel Index	0.603	0.152	0.550	0.186	2.195	1.98	0.05 (Significant)
Mean of angle of lateral Deviation of big toe mean	9.5	4.03	8.26	3.08	2.432	1.98	0.05 (Significant)

Fig-1: The narrowest area in midfoot (A) and the widest in the heel are measured (B), the heel index is calculated(Heel index =A/B).



Fig 2: The angle between the line in the medial side of the foot and the line of the axis of the big toe in foot print calculated. The mean of right and left foot was used in analyses of result.



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بصمة الأقدام دراسة مقارنة بين النساء الشابات في المجتمع الحضري والريفي

مهدي صالح الجبوري ومحمود عبد الجميلي

كلية التمريض - جامعة الموصل

الخلاصة

تم اخذ بصمات الأقدام في وضع الوقوف لمائة امرأة شابة وكان خمسون منهم من المنطقة الحضرية وخمسون أخرى من المنطقة الريفية. تم قياس عامل العقب من البصمات وكذلك زاوية الاتجاه الوحشي للإصبع الأكبر في القدم. الفحص بسيط و يمكن بسهوله إجراءه من قبل الكادر الطبي والتمريضي. أثبتت النتائج انه يوجد هناك فرق إحصائي معتبر بين المجموعتين. ويدل على إن تسطح القدم وانحراف إصبع القدم الأول الوحشي اقل شيوعا في نساء المجتمع الريفي. وهذا يظهر أن اختلاف نمط الحياة واختلاف لبس الأحذية قد يفسر هذا الفرق. أن نمط الحياة الريفي يقلل احتمال الإصابة بتسطح القدم والانحراف الوحشي للإصبع الأكبر في القدم.