Compared of Knee Alignment Index in high school students

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ABSTRACT: The object of this study is Compared of Knee Alignment Index in high school students in Mazandaran Province. For this purpose, 150 subjects (75 males and 75 females) were randomly among people with lower limb structure intact Mazandaran Province were tested. In this study, according to knee examination Performa in genu valgum & genu varum knee examination, we have used of intermalleolar distance and intercondylar distance. The basic examination instrument is: Verner caliper made up of USA by 0.02 mm exactness and side instrument includes: transformed caliper and scaled blade of internal measurement. Datum' analysis has been done by emphasis on determining the mean and standard deviation in age groups and confidence interval of 95% by the aid of SPSS22 software. The results showed that the index IM.IC boys and girls high school students there are a significant difference.

Keywords: Knee, Genu Valgum, Genu Varum, students, High School, students.

INTRODUCTION

One of the most important and most basic health care needs of the student body that provides health. Having the correct position for healthy body alone is not enough though, but part of one's overall health included. Parents and instructors to achieve the correct position of the body and know the factors affecting it, as well as students can share in the health of everyday life (Yoo et al, 2008). Body status and height structure is related to body and mental health. Also, skeleton health is threatened in related to its environment, habits, culture and job. Having enough information about height status is a topic in which being familiarized to it is necessary for anybody (Fathi & Rezaee, 2010). Body status is same alignment of different parts of body to each other. When a person does have feasible status , his body alignment would be balanced as to decrease pressures on his different part of body, instead when he has weak body status, because of higher pressure to different parts of body, his body alignment would exit from equilibrium and this continuous pressure, if became out of balance, if this continuous pressure be low, would lead to non- anatomic adaptability, these changes would change people ability in doing works and is influential on the whole body efficacy (Daneshmandy et al, 2005). While emergence of abnormality in different parts of body is influential on its movement amplitude, therefore in order to evaluate status abnormality require measure and standard in which recognize people body condition (Bigdeli, 2006). From sport creational view, any change in body natural alignment especially in lower part of body is some type of abnormality (Daneshmandy et al, 2007). Muscular skeleton abnormality would emerge in different part of body and its basic cause is putting body in a situation in which is not natural and in long term. The most part of body in which is in exposure of abnormality include body (neck spinal column, back and waist) and lower part of body. Prevalent abnormality of lower part of body include cross and bracket knee in which both of them are some type of disorder in natural alignment of knee. In this regard, finding influential method for decreasing abnormality in lower part of body and its side effect are always the researchers' mental disturbance. We would recognize natural level and limit of these abnormalities to be the base of naturalist or non-naturalist of lower part of body.

There are so many studies in and out of Iran about evaluating knee posture. In researches of Mohammadi (1994), Vakili (2005), Heidary-nik (2007) shows high level of lower part of body abnormality especially among girl and boy students. The examination of these studies shows the amount of body abnormality prevalent especially calf alignment (genu valgum & genu varum) is high in Iran. Penha et al (2005) has evaluated girls posture from 7-10 years old" in

which among 132 girls in four age level has been evaluated, high level of status abnormality has been reported in school years and some of them would be corrected in growth naturally and some of them remain as lower part of body abnormality. According to the topic, cross knee frequency is 64% more than other abnormalities in lower part of body. Also, in Cahuzac et al (1995) study by the topic of completing clinical angle of tibiofemoral in health youth among girls and boys, distance on intermalleolar is less than 4-8 cm and intercandylar distance is less than 4-5 cm has been reported. In Yoo et al (2008) study in completing knee angle on 452 Korean children from 1-15 years old, showed general pattern in knee angle change is the same in Asian and European children. He showed change in knee anatomic angle in three groups: in the first stage (1-4 years old) change in calf alignment reaches from 1 various to the maximum valgus ratio. The second stage (5-8 years old) the amount of valgus has decreased and in third stage (9-15 years old) calf alignment is the same as adult pattern. At last they reported this natural information has been recognized in continuous change in knees' angles on children lower part of body. In this study, in order to evaluate knee angle for evaluating ganovarum and ganovalgum, we have used of whole height graphs of anterior-posterior.and also, Omololu et al (2003) has studied 2166 children from 1-10 years old and showed knee are arched in 1-3 years old and naturally decreases 0 degree. In the two genders after 7 years old in boys, calf was not arched. The amount of knee angle from 1-10 years old in the two genders was 10degree fixed. The mean IC distance was 0.2cm in 1years old and there is no meaningful difference to 10 years old. The most distance of IM among 2-4 years old is reported 2.5-2.2 cm.

Pamela & Ghinwa (2003) has examined children's lower part of body abnormality and found there is always turning and angle problems in lower part of body abnormality in children (internal and external leg claw) and some angle problems including arched leg and X leg in which would be corrected in the most parts and if it have has 3-4 unit of standard deviation from natural limit, it requires surgery. Also in Tradowsy (1990) study by the topic of gender difference in IC distance on 130 men and 130 women showed there is meaningful difference among IC distance of men about 108 mm and women 102 mm (p<0.001). in another research, Nguyen et al (2009) has determined the relation among lower part of body alignment and Q angle on 218 men and women and has resulted Tibiuofemoral and ant version femur angle (spontaneously) are of meaningful estimators of Q angle in the two genders. Rajabi et al. (2015a) to provide soft IM.IC among women and men, and the results showed that in women with normal aging process knee - knee cruciate - knee parenthesis within parenthesis knee and gradual progression in men with during their age.

Although, in internal and foreign studies, almost researchers has mentioned to cross knee and bracket one abnormality by high statistics, but none of them has mentioned to the mean or limitation as an alignment and natural angles of lower part of body. Therefore, it is not clear apprehensive statistics of above studies was based on what basic for evaluating abnormality, because in fact these researchers does not have natural number or limit of those curvature for recognizing lower part of body abnormality and there is no study about in comparison with indicators of lower limb students yet. Also, the have used of visual measurement instrument like plummet line, and New York body situation chart. It is obvious; Researchers could not have high confidence to the result against quantifiable instrument measurement like Ben caliper, caliper, x radiography. We should mention, is result of Knee Alignment Index (Genu valgum & Genu varum) in high school students are different?

MATERALS AND METHODS

This research is among functional researchers pulpous fully and it is describing research among editing method. The study population included all boy and girl high school students in the province with the healthy limb. The sample consisted of 150 patients who were randomly across the province geographic areas (East, West and Central), in the region of 25 girls and 25 boys in total in the 50 region. None of them have has past record of lower part of body disease (Steomalasi, Steoartherit, Traumatism) nerve-muscular, capsule and outer ligament cut, surgery/traumatic disturbance/ breakdown/burning in lower part of body, natural deformity in lower part of body, obvious ach in lower part of body in examination and long term physical activity and membership in professional sport team. The basic instrument of evaluation was caliper Verne made up of USA by 0.02 mm exactness internal measurement calibrated ruler made up of Shinwa Company in Japan by 0.01 millimeter exactness changed caliper. In order to evaluate IC, IM distance, we determined intermalleolar and intercandylar distance of calf. In this regard, we selected internal part of femur, upper part of knee joint, the greatest and the smoothest saliency by back tendency as intercandylar distance and internal saliency of lower part of tibia on upper part of ankle as intermalleolar distance (8). Then we measured the distance among intermalleolar and intercandylar of ankle by caliper. We computed measures and the means 2 times. While current study is determining intermalleolar and intercandylar distance for special society, then the basic statistical method is by emphasis on mean determination for considered age and their standard deviation. In this case, we have used of mean and confidence interval computation equal by 95% and by SPSS$_{22}$ software. The t-test was used to compare between them.

RESULTS

In this case, we considered natural ankle alignment as there was not any distance among intermalleolar and intercandylar distance, natural amount is 0 for the two variables of IM-IC. In this case, we define an index in which consider knee and ankle and one data is natural that there was IM and IC zero. We decrease the amount of IC from IM and reach to a variable by the name of IM.IC in which anybody by zero IM and IC , it means does have natural calf alignment and his knee is not cross or bracket and as a result the amount of IM.IC would be zero. When there is distance among femur condyles and hump were jointed, does have negative IM.IC. As a result, in this study we have used of IM.IC index for determining calf alignment in different level of student in Mazandaran province. We tried to provide required information by details in the firm of table and chart.

Table 1. IM.IC index according to sex (N=250)

Age group	Sex	N	variable	mean	SD	min	max
15-18	boy	125	IM.IC	1.52	1.90	- 2.17	6.52
15-18	girl	125	IM.IC	0.22	1.39	-3.47	4.28

Results Table 1 shows that IM.IC index in boys than girls.

Table 2. The comparison between subjects

factor	gender	average	t	df	sig
IM.IC	boy	1.52	2.89	87	0.007
	girl	0.22			

According to Table 2 shows the results of the index IM.IC among boys and girls high school students in Mazandaran province, there is a significant difference.

DISCUSSION

Although in foreign and internal study, researchers has mentioned to the high level of genu valgum & genu varum abnormality, but none of them has mentioned to the mean or limit as alignment and natural angle of lower part of body. Therefore, it is not clear how are measured the apprehensive statics of those researches, and so far, no study has been found in the comparison of the lower limb. Mokhtari (2009) & Rajabi et al (2015a; 2015b) has examined IM and IC factors separately, but researcher has studied them blending. (in research findings, we mentioned to the method of evaluating IM,IC index) while Mokhtari (2009) has measured samples from anterior or caliper and researcher from posterior and by changed caliper and internal measure calibrated ruler and at last caliper, we have reached to the same result.

Mokhtari (2009) general result: men IC is more than women and women is more than men researcher based on table1 in age level of under 14 , about 90% of samples are in normal range, but in 15-24 years there is outstanding increase in IM.IC index (genu varum). In age level of 25-44 there is increase in IM.IC index (genu varum). The results Rajabi et al (2015a; 2015b) showed that the normal IM.IC girls and boys increased rather jump in the index IM.IC (knee parenthesis) is observed. This study could provide valuable information to Mazandaran health and treatment center and other researchers to get general norm gram for Iran society. This index could be used for recognizing calf abnormality (genu valgum & genu varum) in men section and also in different age groups in Mazandaran to evaluate and recognize early and avoid progress of abnormality prevalent in lower part of body and the bringing up health society.

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