Observational Study on Sexual Dimorphism of Carrying Angle among Natives of Ajmer region

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Abstract

Introduction: - The carrying angle is the angle placed between the median axis of arm and median axis of forearm in full extension and supination position. This angle provides the forearms a clear movement with respect to the hips while walking and is important when carrying objects. Carrying angle is examined in various pre-placement

medical examination. Carrying angle can be used to differentiate between male and female upper limb. This can be used in partial identification if rich regional data is systemically and statistically collected.

Objective:-To collect the statistical data values of carrying angle in both the sexes of Ajmer region. Observing any difference between the caring angle of dominant and non-dominant hand of same individual

Method: - A cross-sectional study was carried out with right handed 100 males and right handed 100 females and variations in carrying angle between males and females were calculated using Goniometer. The value is analyzed by mean, standard deviation

Results: - In males, mean carrying angle of both upper limbs is 10.72^0 where as in females mean carrying angle of both upper limbs is found 13.42^0.

Conclusion: The present study showed that the carrying angle was greater in females than in males and it was greater in non-dominant arm than in dominant arm.

Key words: - *Carrying angle, Goniometer, Extension, Variation*

Introduction

The carrying angle is acute angle between median axis of the upper arm with fully extended and supinated forearm. This angle is associated with the lateral obliquity of arms[1].Secondary sexual characters in females[2 3 4 5 6] leads to greater carrying angle than males. In some cases it was also seen that females and males did not have variations in carrying angle on full extension[7 8 9]. As the skeletal configuration is affected by regional variation and no previous study had been conducted in the past on Ajmer region, therefore this study is planned to collect statistical data of carrying angle from Ajmer region. This study will also provide a sex specific data on variations in carrying angle on full extension, so that it can be used in identification purpose and sex determination in segmented/dismembered bodies. The carrying angle is examined in various medical examination for fitness of jobs especially meant for field services.

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Materials and Method

This is a cross-sectional study among natives of Ajmer region. Carrying angle was measured in both arms of 100 males and 100 females aged between 18 to 24 years using goniometer[1].

Data was manually collected on Microsoft Excel sheet and then analyzed statistically.

Sample universe: - MBBS Students studying JLN medical college, Ajmer

Inclusive criteria: - Cases with parents born in Ajmer were considered as natives of Ajmer. All the cases of age group 18 to 24 years are included in our study

Exclusion criteria: - Cases with history of previous fracture, congenital anomalies, contracture deformity of upper limb are excluded

-All cases with left handed dominance are excluded

Study period: - Sample was collected from 1st May 2019 to 31st 2019 at JLN medical College, Ajmer till sample size was achieved

TABLE No. (1): Distribution of carrying angle among male and female

SN	MALE			FEMALE		
	No. of cases	Carrying angle (rt)	Carrying angle (lt)	No. of cases	Carrying angle (rt)	Carrying angle (lt)
1	26	10.1	10.1	26	13.5	13.5
2	15	10.4	10.5	22	13.2	13.6
3	38	10.6	10.9	31	12.8	13.9
4	12	12.3	12.1	8	13.6	14.1
5	5	19.5	19.7	6	12.2	13.7
6	2	13.1	12.8	4	15.1	14.8
7	1	08.7	09.1	2	10.9	11.8
8	1	15.2	15.4	1	11.7	12.1

Results

When carrying angle was measured out of 200 subjects, 26% did not have variations in carrying angles of their right and left arms. On an average, in males mean carrying angle of right arm was 10.66º with SD 0.919 and carrying angle of left arm was 10.78º with SD 0.779. The mean value of male of both arms is 10.72^0 where as in females, mean carrying arm of right arm was 13.14º with SD 0.644 and carrying angle of left arm was 13.71º with SD 0.369. The mean value of both arms in female is found 13.42^0 .Females had greater carrying angle than males.

Discussion

We have studied variations in carrying angle between males and females. Females had greater carrying angle than males, i.e. arms are more laterally angulated and they have greater carrying angle[2 3 4 5 6.] Non dominant upper limb has more carrying angle then dominant upper limb in both sexes

Conclusion

This data can be used in pre placement medical examination of various services especially required for natives of Ajmer region. There is difference in carrying angle of both side upper limbs so both sides carrying angle should be examined in borderline cases

Suggestions

This data can be used cumulating and compounding with other studies for determination of average value of carrying angle in the population ,so that this can be used in determination of sex of an individual and also in various pre-placement medical examinations of armed forces. This data is useful in identification of segmented/ dismembered bodies

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Point of Conflict: - Nothing Specific

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