ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 5, Issue, 08, pp. 5384-5386, August, 2015

International Journal of
DEVELOPMENT RESEARCH

Full Length Research Article

STUDYING THE RATIO OF SECOND FINGER (FOREFINGER) TO FOURTH ONE (RING FINGER) AMONG ORDINARY PEOPLE IN SOUTH KHORASAN PROVINCE AND COMPARING IT WITH 2D:4D RATIO OF PROFESSIONAL THIEVES IN BIRJAND CENTRAL JAIL

[1]Mahmoud Mirkhalili, *,[2]Omid Milanloui and [3]Fatemeh Mobasheria

[1]University of Tehran, Farabi School, Iran
[2]Criminal law and Criminology, ó Azad Islamic University, Qom Branch and Head of Court-House, Ghayen, Iran
[2]Animal Evolution Biology, Iran

ARTICLE INFO

Article History:
Received 18th May, 2015
Received in revised form
29th June, 2015
Accepted 11th July, 2015
Published online 31st August, 2015

Key words:

2D:4D,
Finger,
Sexual dimorphism,
Thieves.

ABSTRACT

Education Among humans, the length ratio of the second finger (2D) to the fourth finger (4D) is a sexual – dimorphism. The ratio of forefinger to ring finger among women is greater than men 9this ratio is lower for male humans, rats, baboons and finches while this ratio (2D:4D) is greater among Zebra fish males than females). 2D:4D ratio has a reverse relationship with concentration of testosterone prenatal. Therefore, 2D:4D ratio is seen as a proper indicator to examine the prenatal concentration of testosterone. Lower 2D:4D ratio indicates higher muscularity and it is accompanied with higher level of prenatal testosterone or sensitivity to androgen. In 2D:4D ratio, sexual – dimorphism is observed more in right hand than left one. In present paper, 2D:4D ratio in both right and left hands among 105 ordinary individuals and 105 professional thieves sentenced in Birjand Central Jail are studied by using digital calipers (0.01mm) and data collection through questionnaire and by using SPSS16 software package and t-test. Findings indicate that 2D:4D ratio among professional thieves sentenced in Birjan Central Jail is less than ordinary people ($P<0.05$). Based on this finding, it is too likely that the amount testosterone among thieves is higher than ordinary population and thieved are likely commit offence due to further manly hormones.

INTRODUCTION

The length ratio of the second finger (2D) to the fourth finger (4D) is a sexual – dimorphism. The term *sexual dimorphism* means any diversity in the level of morphologic or nucleus. Sexual dimorphism is objective and tangible due to different evolution of internal and external genital organ as well as cross – sexual forms including the size of body, swellings and the content of special cells. There are three types in terms of comparing the length of forefinger and ring finger: the first one is radial type in which the length of forefinger is longer than ring finger and is seen more among women. The second one is alnar type in which ring finger is longer than forefinger and is seen more among men. The third one is intermediate type in which forefinger and ring finger are equal and seen among both men and women. The ratio of forefinger to ring finger among women is greater than men 9this ratio is lower for male humans, rats, baboons and finches while this ratio (2D:4D) is greater among Zebra fish males than females). 2D:4D ratio has a reverse relationship with concentration of testosterone prenatal. Therefore, 2D:4D ratio is seen as a proper indicator to examine the prenatal concentration of testosterone. Lower 2D:4D ratio indicates higher muscularity and it is accompanied with higher level of prenatal testosterone or sensitivity to androgen. In 2D:4D ratio, sexual – dimorphism is observed more in right hand than left one. There are many evidences which indicate that foetal sexual hormones (particularly androgen hormones like testosterone) lead into sexual difference in 2D:4D ratio (Allison and Peter, 2004). Experimental findings indicate that there is a relationship between 2D:4D ratio and adults' sexual hormone levels while it is unlikely the impact by adults' sexual hormones on 2D:4D ratio since this ratio experiences no change after maturity. Dependency and relationship between adults' sexual hormones and 2D:4D ratio is due to the fact that prenatal sexual hormones (which impacts on 2D:4D ratio) relates to the level of adulthood hormone dissemination (Lothar *et al.,* 2007). Fingers' ratio relates to aggression. With lower 2D:4D ratio, men have more aggressive behavior than

Corresponding author: Omid Milanloui
Criminal law and Criminology, ó Azad Islamic University, Qom Branch and Head of Court-House, Ghayen, Iran

women while there is no relationship between fingers' ratio and aggressive behavior among females. Testosterone has an organized impact on aggressive behavior and there is a link between fingers' ratio and aggressive behavior in creating sexual dimorphism. Males with lower 2D:4D ratio has more physical aggression. Lower 2D:4D ratio means higher aggression (Allison and Peter, 2004). In present paper, 2D:4D ratio is studied and compared between ordinary people and professional thieves sentenced in Birjand Central Jail.

MATERIALS AND METHODS

This radical study was conducted in 2013 over 210 of Fars race individuals lived in South Khorasan Province (Iran), of whom 105 were ordinary population (selected randomly) and 105 were professional thieves sentenced in Birjand Central Jail. We acquired demographic data, length of fingers and other needed information via a questionnaire. To achieve the length of forefinger and ring fingers, digital calipers (0.01mm) was used and fingers were put on the margin of a table vertically and then they were measured. Data analysis was conducted by SPSS16 software package. The value of P was less than 0.05 as significance level.

Findings

Upon data collection and confirming the correctness of loading the data in computers by using SPSS and EXCEL software packages, the lengths of forefingers and ring finger of ordinary and professional sentenced thieves as well as their ratios were computed.

- Comparison of the length of 2D in both right and left hands indicated no significance difference among professional thieves (P>0.05).
- Comparison of the length of 2D in both right and left hands indicated no significance difference among ordinary population (P>0.05).
- Comparison of the length of 2D in right hand among professional thieves and ordinary population indicated that there is a significance statistical increase between the average length of right hand forefinger (2RD) of both professional thieves and ordinary people. Comparison of the length of 2D in left hand among professional thieves and ordinary population indicated that there is a significance statistical increase between the average length of left hand forefinger (2LD) of both professional thieves and ordinary people (P>0.05).
- Comparison of the length of 4D in both right and left hands indicated no significance statistical difference among ordinary population and also professional thieves.
- Considering the comparison of 4D lengths between ordinary population and also professional thieves, one can conclude that there is a significant statistical different between the length of right hand ring finger (4RD) of professional thieves and ordinary population.

The same comparison indicates that there is a significant statistical different between the length of left hand ring finger (4RD) of professional thieves and ordinary population ($p < 0.05$).

2D:4D ratio (forefinger to ring finger) between professional thieves and ordinary population

By using t-test for independent groups, the average score of research questions was compared on the ratio of 2D:4D length for right hand of ordinary people (mean = 10.92; SD = 0.55) and the ratio of 2D:4D length for right hand of professional thieves (mean = 0.9525; SD = 0.02). On this basis, one can say that the ratio of 2D:4D (forefinger to ring finger) length for right hand of sentenced professional thieves to ordinary population mitigates significantly ($p<0.05$). The same results were compared for 2D:4D length for left hand of professional thieves (mean = 0.9688; SD = 0.04) and 2D:4D length for left hand of ordinary population (mean = 10.42; SD = 0.63). On this basis, one can say that left hand of professional thieves mitigates significantly with left hand of ordinary population ($p<0.05$).

DISCUSSION

Conducting anthropometric studies to achieve distinguished traits of an ethnical group living in a special geographical sphere not only because that it is important to know the frequency of human morphologies in that group but also as a criterion to compare the features of ethnic groups. Due to the impact by radial, age, gender, nutrition, climate, socio economic and economic factors on body size, it is not possible to extend anthropometrical studies of fingers from one to another country. Likewise, due to special problems of delinquents and hard rules and many administrative steps for working with judicial authorities and prisons, a few studies are conducted on the relationship between biology and crime commission. On the other hand, we found that there were different studies on 2D:4D ratio between men and women in different fields while we couldn't find any research on 2D:4D for men with different professions. Therefore, selecting this issue can be fruitful both scientifically and pathologically. Considering above factors, present was conducted for anthropometric measurement of 2TH and 4TH lengths and studying the trend of changes of such dimensions on 105 sentenced professional thieves in Birjand Ventral Jail and 105 ordinary people from Fars race resident in South Khorassan.

In a study by McFadden and Medland (2005) to study the impact of race or geography on 2D:4D ratio, their findings indicate that 2D:4D ratio of British is similar to Australians not Americans. So, one can conclude that Australians have inherited most of their genes from their antecedents namely other populations in east or west Europe and Scandinavia. Likewise, McFadden (2003) noted that in addition to genetics, geography also impacts on 2D:4D ratio albeit trivial. Therefore, studied individuals were selected from Fars race and it is hoped to conduct studies over other races in future. Studying convicted professional thieves is an idea with the most compatibility with anthropometry possible applications identifying the identity of criminals or recognizing and preventing the crime since Allison *et al* (2004) concluded that there is a relationship between 2D:4D ratio and physical violence among men (Allison and Peter, 2004). In present

paper, since less 2D:4D ratio would improve muscularity, 2D:4D ratio among thieves was shorter than ordinary population. Therefore, thieves have more violence's and commit offences further since high ratio of their muscularity hormones.

According to present study, it is too likely that thieves have such relationship to fingers of hands if violence is seen as a behavior which creates crime. Allison and Baily (2005) measured the length of 2D and 4D fingers among 298 students (149 men and 149 female) who were 19 year – old in average. Likewise, their depression was measured by psychological tests. Their measurements indicated that 2D:4D ratio has a direct association with depression. Depression is a sexual dimorphism. Depression is expressed shown in appearance and depressed persons are akin to stress. 2D:4D ratio has a reversed relationship to the concentration of foetal androgen. It is observed that more 2D:4D ratio namely being closer to femininity would improve depression in both genders. Also, lower 2D:4D ratio namely being closer to muscularity would mitigate propensity to depression. Therefore it is suggested that depression is accompanied with lower amount of prenatal androgen. Individuals with higher levels of foetal androgen experience lower depression. The impact by androgen on depression which is expected to be reflected by 2D:4D ratio can be hidden by uncontrolled factors such menstruation cycle and contraceptive medicines. In present study, most thieves were also drug dependent and depression and environment can be the possible reasons of drug addiction. Addicted thieves had longer 2D:4D ratio than ordinary individuals. As a result, depression can have a significant relationship with theft.

Findings

- The average length of 2RD finger among professional thieves compared to average length of 2RD finger among ordinary population suggests significant statistical increase ($P < 0.05$).
- The average length of 2LD finger among professional thieves compared to average length of 2LD finger among ordinary population suggests significant statistical increase ($P < 0.05$).
- The average length of 4RD finger among professional thieves compared to average length of 4RD finger among ordinary population suggests significant statistical increase ($P < 0.05$).
- The average length of 4LD finger among professional thieves compared to average length of 4LD finger among ordinary population suggests significant statistical increase ($P < 0.05$).
- By using t-test in studying the average length of 2D:4D fingers in right hands of ordinary population and the average length of 2D:4D fingers in left hands of ordinary population, a significant statistical increase was observed which suggests asymmetry ($P < 0.05$).
- By using t-test in studying the average length of 2D:4D fingers in right hands of professional thieves and the average length of 2D:4D fingers in left hands of professional thieves, a significant statistical increase was observed ($P < 0.05$).
- By using t-test in studying the average length of 2D:4D fingers in right hands of professional thieves and the average length of 2D:4D fingers in right hands of ordinary population, a significant statistical decrease was observed ($P < 0.05$).
- By using t-test in studying the average length of 2D:4D fingers in left hands of professional thieves and the average length of 2D:4D fingers in left hands of ordinary population, a significant statistical decrease was observed ($P < 0.05$).

REFERENCES

Allison, A., Peter, L. 2004. Finger length ratio (2D:4D) Correlates with physical aggression in men but not women, Biological physiology xxx xxx-xxx

Leohlin, J., Mcfadden, D. and Medland, s .2006. Populations differences in finger- length ratios, archive are sexual behavior. 6: 739-749

Leohlin, J., Medland, S., Martin, N. 2012. Is CAG Sequence length the androgen receptor gen correlated with finger-length ratio? Personality and individual differences, 52: 224-227

Lippa, 2006, Finger lengths, 2D:4D ratios, and their relation to gender related personality traits and the big five. Biological psychology, 71:116-121.

Manning, J.T., Fink, B. and Neave, N. 2006. the 2nd-4th digit ratio (2D:4D) and neck circumference. Implications for risk factor in coronary heart disease, International journal of obesity, 30: 711-714

Manning, J.T., Scute, J., Wilson, J. and Levis, D .1998, the ratio of 2nd to 4th digit length: a predictor of sperm numbers and concentration of testosterone, luteinizing hormone and estrogen. Human Reproduction, 11, 3000-3004

Schneider, H., Pickle, J., Stalla, G .2006. Typical female 2nd-4th finger length (2D:4D) ratios in to female transsexual possible implications for prenatal androgen exposure. Pcychoneuroendocrinology, 31:265-269

****