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Research Article

Relationship of Birth Parameters and Clinical Variables with the Head Circumference in Medical Students

Elmas Muhsin*

Department of Medical Genetic, Afyon Kocatepe University, Turkey

***Corresponding author**
Elmas Muhsin, Department of Medical Genetic, Afyon Kocatepe University, 03200 Afyonkarahisar, Turkey, Email: drmelmas@gmail.com

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Abstract

Background: Head circumference measurement is an indirect and simple calculation method used to determine whether brain growth progresses normally.

Aims: The head circumference is directly proportional to the mental performance of the person. We hypothesized that the head circumference of medical students is larger than the normal population.

We also searched 20 clinical data of medical students.

Study design: According to the literature, as the head circumference increases, it increases in mental and cognitive functions. We thought that the width of the head circumference should have increased at medical students compared to the normal population.

Methods: A total of twenty parameters were investigated for 408 medical students (229 males and 179 females).

Results: The lowest head circumference in women: 51 cm, the highest in women: 58 cm, the average in women: 54, 52 (50p), the lowest in men: 52, 5 cm, the highest in men: 62, 5 cm, the average in men: 57, 06 (60p). There was no significant relationship between head circumference and birth style, birth time, motor, language and social development stages.

Conclusion: Although it seems like a primitive method, the head circumference provides quick and easy information about the mental functions of a person.

INTRODUCTION

The head circumference provides rough information about the intracranial volume. Head circumference measurement is an indirect and simple calculation method used to determine whether brain growth progresses normally. Growth around the head is very important for brain development [1]. Head circumference has been related to variables of cognitive development such as the number of neurons, the density of synapses and the number of cognitive strategies to solve problems. In this context, head circumference appears to be an important factor in school success and career choice [2,3].

The development of human beings can be evaluated in 3 steps. These are the prenatal, natal and postnatal periods. It was investigated whether or not there was intrauterine growth restriction (IUGR) presence, polyhydramnios, oligohydramnios, in the prenatal period. In the natal period, time of birth, type of birth and birth weight were investigated. In the postnatal period, stories of hypoxic birth and neonatal intensive care were questioned. Hypoxic status that occurs due to placental insufficiency in the mother's womb and / or asphyxia during labor affects the mental functions of the person in her future life [4,5]. So we investigated the hypoxic birth stories of medical students and the stories of staying in the neonatal intensive care unit.

Another issue that we have investigated is birth weight at gestational age. Intrauterine growth restriction (IUGR) a risk for growth retardation [6,7]. Stems from the fact that the fetus does not catch the growth potential determined due to anatomical and / or functional disorders [6].

Another issue that we have investigated is the past surgical operation. Past surgical operation is an important parameter that sheds light on the history of an anonymous inquiry.

Another parameter we question the presence of chronic illness and seizure. Seizures in people's lives are an important indicator of mental and cognitive functioning [8]. Thus we assessed epileptic seizure episodes of people. Another parameter we question is the existence of a relative consanguinity. Consanguineous marriage increases the risk of recessive illness [9]. We surveyed the family trees of participating medical students and conducted pedigree analysis to investigate the presence of genetic diseases in the family. We have also sorted according to their consanguinity degree if there is a consanguineous marriage. In order to be eligible for medical education, it is necessary to enter the first 1% of the university entrance exams. Therefore, our group is a highly homogeneous group with a mental level. The purpose of our questioning of the above parameters was to reveal detailed medical stories of this homogeneous group.

Head circumference reaches adult values around 18 years. There is no expectation of head-to-head growth afterwards [10].

Head circumference percentiles compared with the head circumference percentages of healthy individuals published by Roche and colleagues [1].

To our knowledge, no studies assessed the relationship of head circumference with clinical variables in medical students.

We hypothesized that Turkey in order to receive medical education is required to enter the top 1% in university entrance exams. We expected that the head circumference of the students in this group that proved to be successful would be wider than the normal population.

MATERIALS AND METHODS

408 medical students (229 males and 179 females) were included in the study. In our work, information was collected in 3 ways. Hospital records, screening of the files and, if necessary, data from family interviews. First, we measure the head circumference of 408 learners with a standard measure [11]. Measurements of the head circumference showed the largest front occipital distance between protuberantia occipitalis externa and glabella with non-stretch bone grafts according to standards [12,13]. In the second phase, we reached the necessary information to study the health data and files of the students. Twenty parameters includes gender, age, length, body weight, head circumference, birth weight, methods of delivery, time of birth, getting newborn intensive care support (hypoxic birth, jaundice, iugr, post term), motor, social and language development, surgical operation, epilepsy, chronic disease, family tree, parental consanguinity, genetic disease in the family. Finally, the head circumference, height and weight of medical students were compared with the analyzed by Statistical Package for Social Sciences version 18.0 (SPSS Inc., SPSS IBM, Armonk, NY, USA). Continuous data were expressed as mean ± standard deviation (range: minimum-maximum) whereas categorical data were denoted as numbers or percentages where appropriate. Chi-square test was used for the statistical comparisons. Two-tailed p values less than 0.05 were accepted to be statistically significant.

RESULTS

229 male and 179 female participated. Individuals between 18 and 33 years of age have been included. Head circumference reaches adult values around 18 years. There is no expectation of head-to-head growth afterwards [10].

The average age is 22.52. For female who participated, the minimum height is 150 cm and the maximum height is 184 cm. The average height is 164.93 cm. (55p). The lowest height is 155 cm and the highest height is 202 cm in males. The average height is 178, 11 cm. (52p) (Table 1).

The lowest weight of female participating in my study is 35 kg; the highest weight is 85 kg. The average weight is 57.53. (25-50p). The lowest weight in men is 54; the highest weight is 130 kg. The average weight is 76.62 kg. (50-75p)

The results of participants' birth weights were as follows. The lowest birth weight of female participating in my work is 1.25 kg. The highest birth weight of female is 5.5 kg. The average birth weight of female is 3.27 kg (50p). The highest birth weight in men is 6 kg. The lowest birth weight for men is 1.5 kg. The average birth weight in men is 3.4kg (50p).

As for the results of delivery type. 330 people were spontaneous vaginal delivery (SVD). Corresponding to 81%. 78 people are in cesarean section *(*C-section). Corresponding to 19%.

According to our research result about the birth time of medical students; 352 of the participating individuals were born as term (Corresponding to 86%), 36 preterm (Corresponding to 9%). and 20 post term (Corresponding to 5%).

The number of individuals with a low APGAR score (under 7 score) after birth was 3 people (0, 73%).

As for the participants' newborn aftermath stories of intensive care. 379 individuals never stayed in neonatal intensive care unit (92, 89 %). number of individuals receiving phototherapy in neonatal intensive care unit after birth due to jaundice 11. (2, 69 %). The number of individuals in neonatal intensive care unit due to low birth weight after delivery was 14 (3, 43%). Only one of the participants (0.24%) remained in neonatal intensive care unit due to hypoxia due to post mature birth.

The results of the 3 parameters (surgical operation, seizure and chronic disease) investigated by participants were as follows. 30 women and 60 men underwent any surgical operation before, and there were no surgical operations in 149 women and 169 men. The main surgical operations experienced by medical students were these. Tonsillectomy (25), Septum Deviation (9), lipomesis (8), reconstruction operation (7), hernia (6), appendectomy (5), trauma (4), orthopedic surgery (4) (3), cholecystectomy (2), pyloidoid sinus (2), microsurgery (2), surgical operation due to nail plucking (2). 27 women and 26 men have chronic disease, and there were no chronic disease in 152 women and 203 men. The most common chronic diseases seen in medical students were as follows. Allergy (9), Asthma (8), Sinusitis (6), Hypothyroidism (5), Migraine (4). The rarely chronic diseases were Hyperthyroidism (2), Pharyngitis (2) Bronchitis (2), and Diabetes (2) Insulin Resistance (2). The rarest Hypertension (1), Thalassemia (1), Rheumatoid arthritis (1), Urticaria (1), Gastritis (1), Familial Mediterrian Fever (FMF) (1).

There were no seizure in 174 women and 217 men. The diversity of the seizures seen in women was as follows. 2 epilepsy, 3 febrile convulsions. The diversity of the seizures seen in men was as follows. 5 epilepsy, 7 febrile convulsions.

The pedigree analysis of the participants was as follows. Especially two parameters were investigated in the pedigree analysis participants. Parental consanguinity. Presence of any genetic disease in the family. While there was no consanguineous marriage in 358 participants, first degree consanguineous marriage was found in 19 participants, second degree consanguineous marriage in 13 persons and third degree consanguineous marriage in 18 persons. The results of investigating the presence of any genetic disease in the family were as follows. 6 cerebral palsy, 5 Down syndrome, 4 autistic, 4 epilepsy, 4 cystic fibrosis, 4 Huntington, 4 hydrocephalus individuals.

The results of the participants' main surroundings, which constitute the main framework of our study. The lowest head circumference in women: 51 cm, the highest in women: 58 cm, the average in women: 54, 52 (50p), the lowest in men: 52, 5 cm, the highest in men: 62, 5 cm, the average in men: 57, 06 (60p). According to our research results, there was a significant relationship between head circumference and gender. It has been determined that the head circumference is larger in males.

There was a correlation between head circumference and clinical variables age, height, weight and birth weight and head circumference. Height and weight are highly correlated with head circumference (Table 2).

There was no significant relationship between head circumference and birth style.

According to our results, there was no significant relationship between head circumference and birth time.

When we looked at our results, there was no significant relationship between motor development and head circumference.

According to our results, there was a significant relationship between head circumference and surgical operation.

However, this result is thought to be due to the fact that most of the participants with surgical operation are male.

DISCUSSION

The relationship between Alzheimer's disease (AD) and the head circumference has been investigated in many researches carried out to date.[3] Another issue that researchers are most curious about is the relation between AD and education level. People with higher education levels are less likely to get AD [2]. In addition to all these studies, we compared the head circumference measurements of individuals who received medical education with the normal population. The results we have found reveal that the head circumference length of individuals receiving medical education is greater than the normal population. In this respect, our results are also compatible with the literature. In other words, the head circumference is greater in the medical student than general population.

Another result that delivery type of medical students emerging in our research. 330 people were spontaneous vaginal delivery (SVD). Corresponding to 81%. 78 people are in cesarean section (C-section). Corresponding to 19%.

Our research group is at least 18 years old. So we can indirectly think that the C / S rates 18 years ago are lower. Or in other words, the C / S frequency has increased in our country [14].

According to our research result about the birth time of medical students; 352 of the participating individuals were born as term (Corresponding to 86%), 36 preterm (Corresponding to 9%). and 20 post term (Corresponding to 5%). According to the 2015 TUIK (Turkish Statistical Institute) data in our country, the rate of premature birth is 6-10%.

According to Turkish Statistical Institute (TUIK) data of 2016, the frequency of consanguineous marriages was determined as 23.2%. However, according to my research, the rate of consanguineous marriage of medical students was determined as 8, 16% [14].

Table 1: Head circumference and gender relation.

	Head circumference		
Gender	Min-Max	Average ± SS	p
Male	52,50 - 62,50	57,06 ± 1,71	,000
Female	51-58	54,52 ± 1,42	

Table 2: Findings correlated positively with head circumference.

Head circumference corelation	Head circumference	Age	Length	Weight	Birth weight
correlation coefficient	1	,248	,624	,680	,165
p	-	,000	,000	,000	,001

CONCLUSION

The head circumference was broader in subjects receiving medical education and a positive correlation was found between age, height, weight and birth weight and head circumference.

Height and weight are highly correlated with head circumference.

The most common chronic diseases seen in medical students were as follows. Allergy, Asthma, Sinusitis, Hypothyroidism, Migraine. The rarely chronic diseases were Hyperthyroidism. The main surgical operations experienced by medical students were these. Tonsillectomy, Septum Deviation, lipomesis, reconstruction operation, hernia, appendectomy, trauma, orthopedic surgery, cholecystectomy, pyloidoid sinus, microsurgery, surgical operation due to nail plucking

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