

ON VARIATIONS OF HEAD CIRCUMFERENCES IN VRŠAC CHILDREN AND ADOLESCENTS

Ž. Gavrilović

Laboratory of Human Biology, Institute of Biology, Faculty of sciences,
University of Novi Sad, Novi Sad, Yugoslavia

Abstract: The author studied variations of head circumference in 1503 children and adolescents aged 7-18 years, both sexes, in Vršac (Vojvodina). The head circumference is found to increase with age in both sexes. The difference between the means is statistically significant in favour of the males in all ages except for the 11 and 12 year-old groups. The head circumference of seven year-old boys is larger than in girls of the same age. The same is also true for 18 year-old age-groups. The greatest percent increase of the head circumference is in 14 year-old boys and in 11 year-old girls.

Key words: Head circumference, Adolescents, Vršac.

Two decades ago we pointed out the great importance of assessment of the head circumference both from the theoretical and practical aspects. Its variations are important as for human evolution as well as for the manufacture of caps, hats and berets. It is particularly important for the army needs paying a special attention to these examinations. This kind of studies is a constituent part of applied anthropology of which major goal is an application of the results obtained to everyday practice.

According to our earlier studies on the head circumference in children, adolescents and adults (Gavrilović and Štambuk 1966), this parameter increases until the age of 18 years, with a sexual difference before 10 and after 20 years of age.

The head circumference in schoolchildren in Vršac ranged between 52.9 and 56.0 cm in boys and between 52.2 and 56.7 cm in girls according to earlier studies (Štambuk 1937), and there was only one case with a too small size of 48 cm at the age of 11 years. Except for the age of 14 years, the head circumference on average was greater in boys than in girls.

Our study was aimed to establish the variations in the head circumference among children and adolescents within the period 7-18 years of age.

Material and Methods

The sample included 1503 children and adolescents of both sexes, aged 7-18 years. The head circumference was measured with a centimetre tape by Martin's anthropometric technique (Martin-Saller 1956). The means and standard deviations were calculated for the data obtained on a Texas instrument digital computer TI-51-III. The differences between the means were tested by the t-test. The tempo of an increase represents the annual growth rate.

Results

In Table 1 the means of the head circumference by sex and age are presented.

As it is seen from Table 1, the means for the head circumference increase with advancing age, for its maximal value in male adolescents (57.11 cm) and female adolescents (54.82 cm) at the age of 18 years. The largest variability in this parameter is in 12 year old boys and 11 year old girls. In the age-groups studied the head circumference ranges be-

Table 1. Head circumference of children and adolescents according to age and sex

Age (year)	Boys				Girls				t
	N	\bar{x}	s	Min-Max	N	\bar{x}	s	Min-Max	
7	46	52.30	1.35	50-56	64	51.30	1.60	47-55	4.08
8	63	52.76	1.50	49-56	50	51.61	1.27	49-55	4.42
9	53	53.04	1.53	50-57	62	52.22	1.37	49-56	3.04
10	58	53.59	1.46	51-57	61	52.70	1.26	51-55	3.56
11	76	53.68	1.43	50-58	63	53.38	2.09	50-57	0.97
12	66	54.33	1.79	50-59	58	54.02	1.81	50-57	1.00
13	53	54.77	1.75	51-58	63	53.94	1.67	51-58	2.59
14	50	55.60	1.63	53-59	60	54.35	1.72	51-59	3.90
15	56	56.18	1.49	53-59	103	54.72	1.57	51-58	5.84
16	57	56.73	1.55	54-60	41	54.76	1.56	52-58	6.15
17	111	56.67	1.48	53-61	64	55.10	1.39	52-58	7.13
18	64	57.11	1.48	54-60	61	54.82	1.52	52-59	8.51
Total N	753				750				

tween 50-60 cm and 47-59 cm in boys and girls, respectively. The sex differences for the head circumference exist in all ages in the period studied except for 11 and 12 year-old individuals.

Fig. 1 illustrates the trend of the means for the head circumference by sex and age.

In male adolescents the head circumference is larger at all ages in comparison with female adolescents. The smallest difference is observed at the age of 11 and 12 years and, as previously emphasized, it is not statistically significant. The highest growth intensity for the head circumference is in 14' year-old boys and 11 year-old girls (Fig. 2).

Discussion

In this study the author presented the variations of the head circumference in Vojvodina children and adolescents. Thus, he confirmed the earlier findings of Štambuk (1937) for that town, i.e. the means of the head circumference increase with advancing age in both sexes, and they are larger in male than in female individuals.

With regard to the data on the head circumference of adolescents in Belgrade, however, there are sex differences in dimorphism. In Belgrade we have found the differences by sex before the age of 10 and after the age of 18 years (Gavrilović-Štambuk 1966). In this study the differences observed between male and female children do not seem to be statistically significant except in 11 and 12 year-old persons.

The present study indicates that the head circumference in children and adolescents ranges similarly within the variants as they did 20 and 50 years ago.

We consider that a comparison of these data will be interesting after exchange of some generations.

The practical implication of the present investigation is to offer the percent variability of this parameter within the minimal and maximal value ranges.

Conclusion

Based on the data presented in this paper, the following conclusions can be drawn:

1. The head circumference increases with an advancing age in both sexes.
2. The differences in the means between male and female adolescents are statistically significant in favour of the males, except for 11 and 12 year-old individuals.

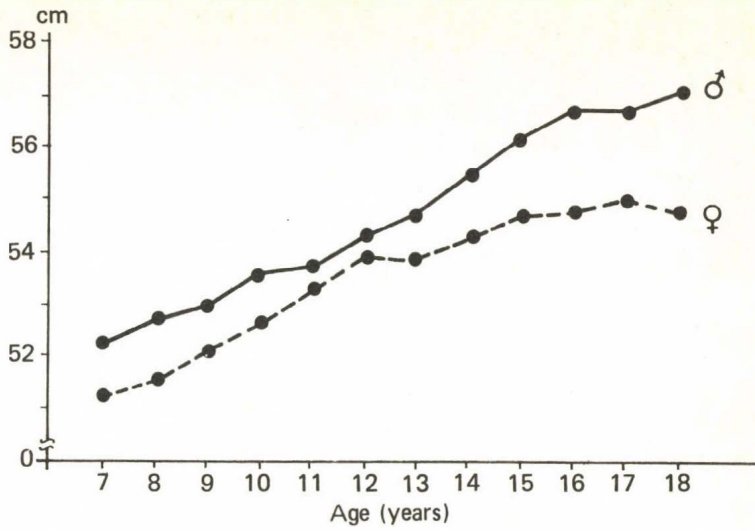


Fig. 1: Changes of head circumference according to sex and age

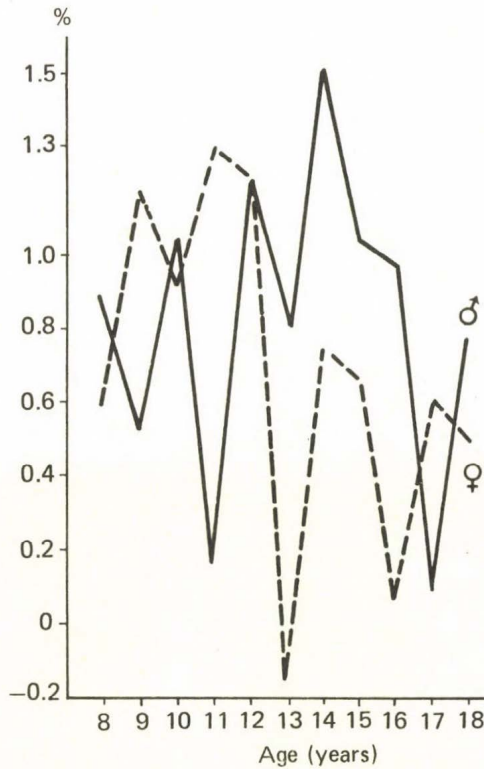


Fig. 2: Percent annual increase of head circumference

3. The highest growth intensity for the head circumference is in 14 year-old boys and 11 year-old girls.

References

- GAVRILOVIĆ, Ž. – ŠTAMBUK, M. (1966): Changements ontogénétiques de la circonference cranienne dans la population de la république de Serbie. – Acta F. R. N. Univ. Comen (Bratislava). X. 8. Anthropologia 11; 363–365.
- MARTIN, R. – SALLER, K. (1957): Lehrbuch der Anthropologie I. Gustav Fischer Verlag, Stuttgart.
- ŠTAMBUK, M. (1937): Prilog biometriji školske dece. – Socijalno-medicinski pregled 9; 115–124. Štamparija Centralnog higijenskog zavoda, Beograd.

Mailing address: Prof. Dr. Ž. Gavrilović
Laboratory of Human Biology, Institute of Biology
YU – 21000 Novi Sad, Yugoslavia