Bulgarian Academy of Sciences

Acta morphologica et anthropologica, 4
Sofia • 1997

Anthropology

Anthropometrical characteristics of the nose of adult Bulgarians

Y. Yordanov, A. Nacheva, S. Randelova, Ts. Kazakova, E. Lazarova, L. Yordanova

Institute of Experimental Morphology and Anthropology, Bulgarian Academy of Sciences, Sofia

The aim of the present paper is to make a detailed metrical characteristics of the nose in adults Bulgarians from both sexes and to study the specificity of the intersexual metric differences. 100 men and 103 women at the age of 21 up to 40 year are invesigated. The study's programme consist of 13 metric features (6 of which are newly introduced from the authors) and 2 indices — one characterizing the nose form and the other — the intersexual differentiation of the studied features.

The results show that the category — leptorrhin dominate in the investigated men and women. Juxtaposing the height and length of the nose it is obvious that the top nose position defines a transition form between concave and straight ones. The intersexual differences in the metrical data of all the investigated features are statistically significant — except the radix nose breadth. The other nose breadths are with the highest sexual differentiation.

Key words: anthropometry, human nose, metrical variety, intersexual differences.

Anthropometric characterization of the particular body organs and parts is both of anthropological and of medico-biological importance as well as it is valid for application in the practice. In this respect the study of the shape and the size of the nose and its prominence in particular which represent some of the most specific for the human somatic features, renders a special scientific interest.

Anatomic and anthropological sciences dispose of various and exact data about nose structure and its function as an olfactory and respiratory organ, about its growth and development in phylogenesis as well as in ontogenesis [1, 2, 3, 6, 7]. It is a pity, however, that the anthropological data on the normal metric variety of the morphological characteristics of the nose, are scanty although they are of especially great importance both in the sense of general biology as criteria for age differences, sexual differentiation and so on, and for the diagnosis and treatment of various inborn and acquired defects and malformations of the nose. In medico-biological literature scarce data is found most often about cases with morphological pathology of the nose and about concrete operative approach of the rhinoplastics carried out. Purely anthropologically metric data on the nose are published mainly as part of the total

cephalometric characteristics of the man in which most often only the length, height and width of the nose are included. Representative cephalometric studies have been carried out in Bulgaria with data published about all three basic parameters by St. Vatev, M. Popov, Y. Yordanov etc. [4, 5, 8]. In the purposefully surveyed literature, however, a special attention should be paid to the writings of Madjarov et al. revealing data about a great number of metric characteristics of the nose and its distances from the chin, the mouth, and the ears without analyzing, however, the specificity of the intersexual differences among them.

The AIM of the present study is to work out detailed metric characteristics of the nose in adult Bulgarians from both sexes and to study the specificity of the intersexual metric differences.

Material and methods

Detailed cephalometric study has been carried out including 13 metric features of the nose in 100 men and 103 women aged between 21 and 40 (Figs. 1, 2). All individuals studied were clinically healthy and with preserved dentition and occlusion. Six of the metric features of the nose were introduced by us for a more detailed characterization of the shape and size of the allae nasi, the nostrils and the outer septum between them (No. No. *6–13* of the Table 1). We additionally calculated two indices as well one of which typified the nose shape and the other characterized the sexual differentiation according to the different features. The metric data have been biostatistically processed and the statistical significance of the intersexual differences was estimated by the Student's t-criterion at a significance level of 0,05. The degree of sexual defferentiation has also been determined for the different features the

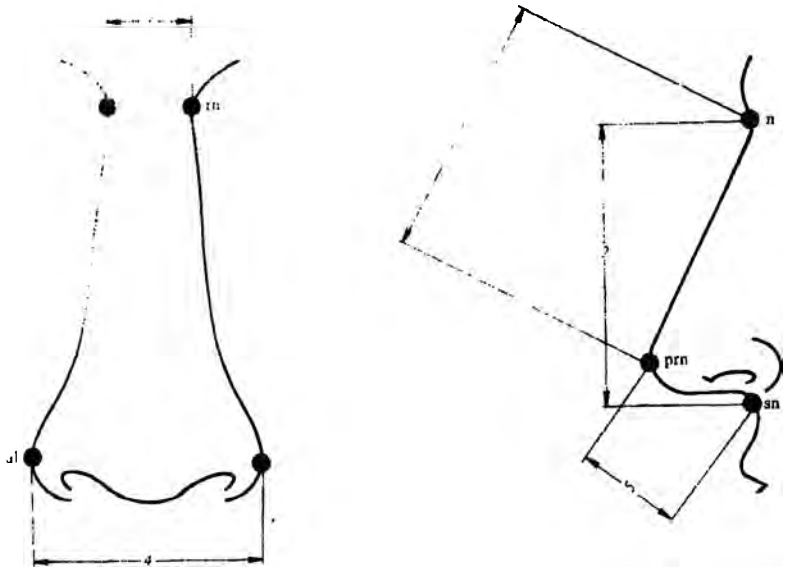

Fig. 1

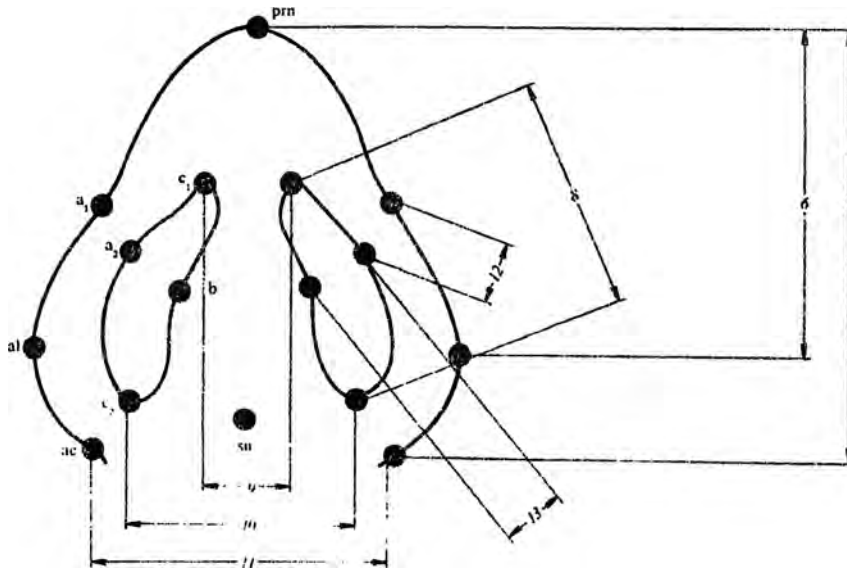

Fig. 2

gradation being carried out by the percentile analysis on the basis of the value range of the corresponding indexes. In the data from the present investigation the range is 16,67. Three degrees of sexual differentiation have been distinguished. The values limiting them are as follows: I degree — 100—105,55; II degree — 105,56—111,10; III degree — 111,11—116,67.

Results, analysis and discussion

The metric data are shown in table 1.

A general aspect of the nose shape is presented by the index of the ratio between the nose width and nose height. According to its categories after Martin and Saller (Fig. 3) among the individials studied by us the leptorrhin ones prevail—in women the account for even more of 90 per cent of the cases. In the category of the mesorrhin ones 18,56 per cent of the males and only 6,80 per cent of the women are represented. In the chamerrhin category none of the studied males are present and in women it is found extremely rarely — in only 0,97 per cent of the cases. These results show that in the individuals of our sample the proportion of the nose as a whole is elongated this trait being better pronounced in women. Similar are the data about the nose shape of other investigators of the Bulgarian population such as St. Vatev and M. Popov [5, 7]. Having in mind that their studies have been carried out on a much great number of individuals i. e. their sample is much more representative it follows that the identical result about this fundamental nasal characteristics confirms indirectly the representativity of the data from our study also about the rest of the investigated features.

An additional idea of the nose shape is also derived from the juxtaposition between the values of the two basic dimensions of the nose — its height and its length. Both in men and women the two features have relatively identical values with a slight

Table 1. Investigated features

No — features	Men			Women				♂/♀
	$\bar{x}$	σ	v	$\bar{x}$	σ	v	T	%
1 — nose length (n—prn)	5,52	0,40	6,69	5,12	0,39	7,56	7,27	107,81
2 — nose height (n—sn)	5,60	0,34	6,12	5,26	0,35	6,66	6,94	106,46
3 — radix nasi breadth (rn—rn)	1,93	0,23	12,02	1,90	0,25	13,09	0,88	101,58
4 — nose breadth (al—al)	3,66	0,25	6,70	3,24	0,26	7,80	11,67	112,96
5 — nose protrusion (prn—sn)	2,04	0,23	11,13	1,97	0,25	12,80	2,06	103,55
6 — ala nasi length to the alare (prn—al)	3,29	0,20	6,11	2,97	0,24	7,98	10,32	110,77
7 — ala nasi length to the nose base (prn—ac)	3,05	0,22	7,27	2,79	0,22	7,99	8,39	109,32
8 — longitudinal diameter of the naris (c_1 — c_2)	1,66	0,20	12,31	1,46	0,19	13,32	7,14	113,70
9 — septum nasi breadth at the front (c_1 — c_1)	0,73	0,13	17,48	0,66	0,12	18,00	3,89	110,61
10 — septum nasi breadth at the back (c_2 — c_2)	2,17	0,24	10,97	1,86	0,21	11,36	9,69	116,69
11 — breadth of nose base (ac—ac)	2,38	0,28	11,56	2,11	0,21	10,14	7,71	112,80
12 — ala nasi thickness (a_1 — a_2)	0,53	0,09	16,42	0,48	0,09	18,79	3,85	110,42
13 — transversal diameter of the naris (a_2 — b)	0,83	0,13	16,05	0,77	0,12	15,09	3,33	107,79
14 — index of nose form (al — al) : (n—sn)	65,62	5,67	8,64	61,75	6,52	10,55		

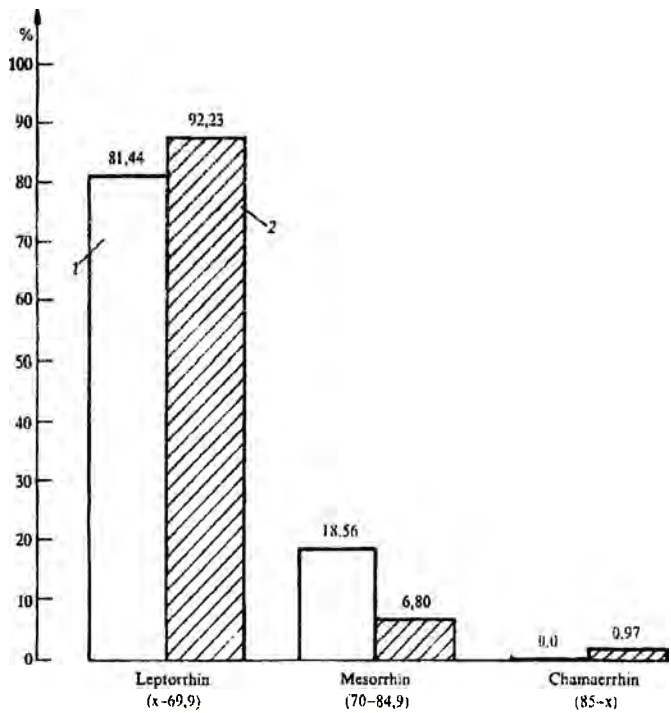

Fig. 3. Nose form — categories by M a r t i n and S a l l e r [3] and its percentage distribution

1 — males; *2* — females

prevalence of the height size. These data show that the position of the nose apex as opposed to its basis rates it a nose of a transitional shape between the concave and straight ones.

The morphograms constructed render a more wholesome picture of the metrical characteristics of the nose of the individuals under study (Fig. 4). The numerical signs for the different radiants correspond to the original numbers of the features in the table. As it is seen from the morphograms with the whole set of the studied features the males are logically with bigger sized noses. Where as it must be noted that the metrical intersexual differences are statistically significant for all features with the exception of the radix nasi breadth only. Comparatively speaking, the intersexual differences in the basic lengths and widths of the nose (*1, 2, 4* and *11* features), in the allae nasi sizes (features *6* and *7*) and in the outer sizes of the nose septum (features *9* and *10)* are of greater distinction.

The calculated indexes of sexual differentiation and the corresponding gradation of the established differences give an objectivized and more complete

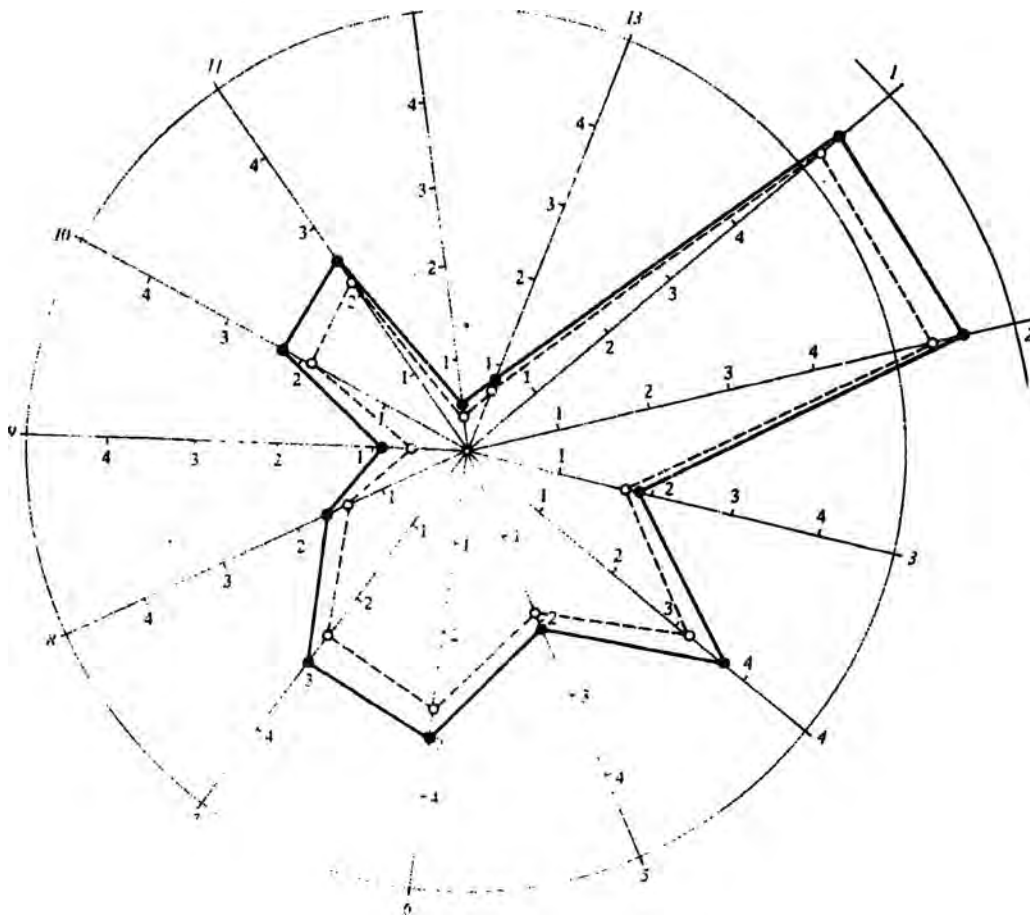

Fig. 4. Morphograms according to metrical data of the investigated features
– males; · · · females; *1* – *13* – features

demonstration of the intersexual differences in the sizes of the features under study (Fig. 5).

As it is seen in the graph the highest III degree of sexual differentiation display the four features: the longitudinal diameter of the naris and the three width features as follows: septum nasi breadth at the back which actually represents the back distance between both nares, the nose breadth and the breadth of the nose base. 7 out of all features under study show a medium degree of sexual differentiation, where the length-thickness nose characteristics prevail such as length and height of the nose, the two lengths of the allae nasi, the transverse diameter of the naris, the thickness of the allae nasi, etc. The lowest degree of sexual differentiation is yielded only by 2 of the features under study — these are the nose protrusion and the radix nasi breadth.

The results obtained in the following investigation can be summed up in the following directions:

1. A detailed metric characterization of the nose of adult Bulgarians of both sexes has been carried out which has never been done before in our country. In this way, data on the metric varieties of the morphological' characteristics of the modern Bulgarian nose are supplied.

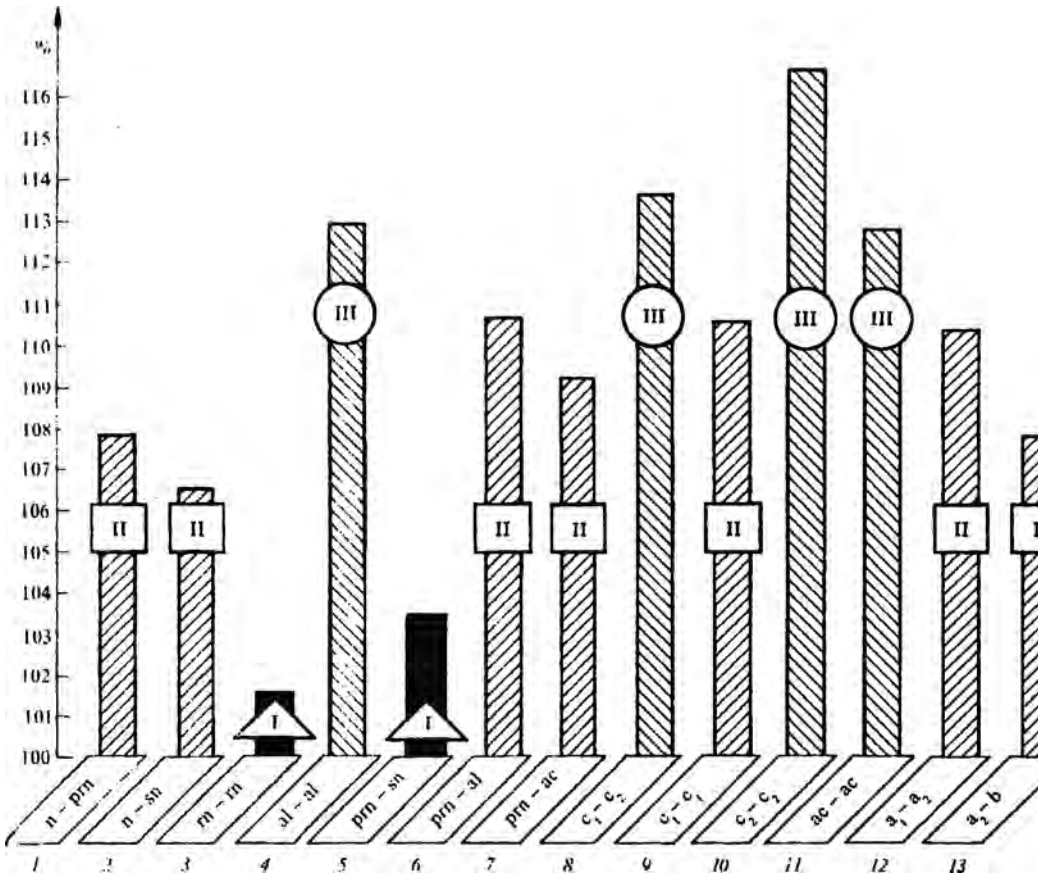

Fig.5. Degrees of the intersexual differences
I — 100—105,55%; II — 105,56 — 111,10%; III — 111,11 — 116,67%; *1 —13* — features

2. The intersexual differences for the features under study are assessed and analyzed establishing that with the exception of the radix nasi breadthall other features show a high degree of statistically significant sexual differentiation.

3. Bearing in mind the fact that there are no such data on the metric characterizartion of nose in the world anthropological literature the complex of features studied in the present investigation can be accepted as a guiding programme for future studies in that direction.

4. Purely pragmatically, the data from the following study have already served as a basis for the workout of phantom models for the production of respiratory protective devices in the military industry — such as breathing masks, etc.

5. In the medico-biological aspect the data obtained can be used in the plastic anthropological reconstruction of the head after the skull and in the practice of rhinoplastic surgery.

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