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K. HAJNIŠ, R. PETRÁSEK, J. LOUBOVÁ

A COMPARISON OF WANKE'S CLASSIFICATION WITH ŠKERLJ-BROŽEK-HUNT'S METHOD IN THE DETERMINATION OF SOMATOTYPES

Department of Anthropology, Charles University, Prague
and Centre for Metabolism and Nutrition, ICEM, Prague—Krč

There is a variety of methods for the determination of constitutional somatotypes at the present time. However, since they are often established on a distinct basic and since numerous methods use different terminology, the comparison of the results obtained is mostly associated with many difficulties and is quite impossible in many cases.

The present communication reports the results of an attempt to compare the frequency of individual somatypes in a population sample from Prague from 18 - 33 years of age. The determinations were carried out with two different methods: Wanke's Method for the determination of constitutional types (Wanke 1954) and the procedure devised by Škerlj, Brožek and Hunt (1953). Since in these two methods is used a distinctive procedure for determination of somatotypes, we have assessed equally the basis of their establishment.

MATERIAL AND METHODS

For the determination of somatotypes, by the above mentioned methods, we have used the data obtained by the examination of small series of 93 females and 59 males. All of them were adults aged from 18 - 33 years and were clinically normal. In the aim to obtain a maximum homogeneity of the series the investigations were carried out on probands with similar professional activities, i.e. on university students, scientific workers, teachers, laboratory workers etc. In order to obtain a homogenous series, also with regard to body height and weight, only individuals with body weight which did not deviate by more than ±15 percents from the ideal weight according to Broca's formula were admitted into our study.

The examination of all probands was carried out in 1965 - 1971 at the Centre for Metabolism and Nutrition of the ICEM at Prague-Krč.

All individuals were classified according to their constitutional type by a modification of Wanke's Method (Wanke, 1954; Hajniš et al., 1974) and by the Morphognostic Method of Škerlj, Brožek, and Hunt (1953) which was also modified in the aim of greater objectivity.

It is well known that the use of morphological descriptive methods yield results which may be biased by subjective views. Therefore an attempt was made to introduce into the exclusively morphologic Method of Škerlj, Brožek and Hunt at least three major elements of an objective assessment in the form of measurements of three circumferences. Subsequently the magnitude of these circumferences was taken into consideration, during the subdivision of the probands into individual types.

These measurements included the chest circumference in normal position (M 61), the gluteal circumference (M 64; 1) and the circumference of the right thigh (M 68). The mean values ($\bar{X}$) and the standard deviations (s) were used for the subdivision of circumferences into three grades of magnitude. Individuals with a circumference which was less than $\bar{X} - \frac{s}{2}$ were assigned into grade 1 (below the average value), probands with a circumference $\bar{X} \pm \frac{s}{2}$ were assigned into grade 2 (an average circumference) and individuals with a circumference larger than $\bar{X} \pm \frac{s}{2}$ were appointed as grade 3.

Table 1. Classification of somatotypes by the method of Škerlj, Brožek and Hunt on the basis of the combinations of magnitude grades of the circumferential dimensions

Somatotype	Combinations (Chest circumference-gluteous-thigh)								
Normal	111	112	121	122	211	212	221	222	223
	313	323							
Rubens	333								
Superior	311	322							
Inferior	133	233							
Truncal	321	331	332						
Extremital	113	123	213	223					
Mammal	312								
Trochanteric	232								

Thus each proband was characterized by three values representing the grades of magnitude of individual circumferences. The probands were assigned into individual somatotypes on the basis of combination of these values. Table 1 shows the allotment of these combinations of grades of all measured circumferences into individual somatotypes of the Škerlj-Brožek-Hunt's classification. The first figure of the combination denotes the grade of the circumference of the chest in normal position,

the second represents the gluteal circumference and the third designates the grade of the circumference of the thigh.

As the basis for the classification of individual somatotypes, with the help of the measured combinations of grades, served the presumed relation between the circumference values and the distribution of subcutaneous fat tissue. An additional visual examination of the proband was necessary only in a few cases. It was carried out either by direct examination or with the help of photos. This proved necessary e.g. in probands with the combination 323. There were only two individuals with this combination and both were defined as a normal type.

Though Škerlj, Brožek and Hunt's typology was devised for females, we have made an attempt to use it for the classification of somatotypes in males. We are well aware of the fact that it is not fully satisfactory for this purpose, and therefore we underline once more that its use represented merely an attempt of comparison of the results obtained by two distinct typologic methods in males with those ascertained in females.

RESULTS

The survey of the data on the frequency of individual somatotypes ascertained by the two above mentioned methods (Table 2 and 3), showed a situation rather confused. The somatotypes determined by either method differed and pointed out no mutual agreement.

Table 2. The frequency of individual somatotypes according to the modification of Wanke's method

Type	Women		Men	
	n	%	*n*	%
Leptomorf	7	7,53	4	6,78
Leptomesomorf	21	22,58	20	33,90
Mesomorf	36	38,71	14	23,73
Mesopyknomorf	22	23,65	16	27,12
Pyknomorf	7	7,53	5	8,47

The pyknosomatic and the Rubens type were to a certain degree equivalent, as it was confirmed by the conformity of their occurrence. We are faced with a more complicated situation when we attempt to find the somatotype, corresponding to the normal type of Škerlj-Brožek--Hunt's classification. Its high frequency above 60 percents in both sexes — has no analogy with the results obtained by Wanke's Method. It would be logical to assume that type corresponds to the mesomorph type of Wanke's classification, however the ascertained frequency of the latter is obviously lower. The frequency of the so-called „normal type" according to Škerlj-Brožek-Hunt's classification corresponds ap-

Table 3. The frequency of individual somatotypes according to the modified method of Škerlj, Brožek and Hunt

Type	Women		Men	
	n	%	*n*	%
Normal	60	64,52	36	61,01
Rubens	8	8,60	5	8,47
Superior	1	1,07	2	3,39
Inferior	9	9,78	3	5,09
Truncal	0	0,00	4	6,78
Extremital	7	7,53	5	8,47
Mammal	1	1,07	0	0,00
Trochanteric	7	7,53	4	6,78
Pseudosteatopygic	0	0,00	0	0,00

proximately, in both sexes, to the number of probands assigned by Wanke's Method into the meso- and leptomesomorph types.

Any attempt to find by the Method of Škerlj, Brožek and Hunt any single type which would be equivalent to Wanke's leptomorph somatotype is obviously doomed to failure. None of the types defined by Škerlj, Brožek and Hunt is characterized by a somatic build which would correspond to this type. Similarly it is impossible to designate by this typologic method (Škerlj, Brožek, Hunt) any type which fully corresponds to the mesopyknomorph somatype defined by Wanke. Its characteristics may bear some resemblance with the complex of the superior, inferior, truncal, extremital, mammal and trochanteric types of Škerlj, Brožek and Hunt. The frequency of these somatotypes, presented in Table 3, in both sexes, exceeds by 3 - 3,5 percents the frequency of the mesopyknomorph type presented in Table 2, yet it is the only possible comparison.

Thus it is evident that a comparison of the results obtained with these two methods is associated with great difficulties and remains open the question whether it is actually possible. This is obviously due to the distinct principle of both methods. While Wanke's Method consists in the determination of individual somatotypes on the basis of a series of somatometric traits, the procedure of Škerlj, Brožek and Hunt, consists exclusively of visual examination. In addition to body height and weight, which we consider of major importance in the form of Rohrer's index for the determination of constitutional types, Wanke's Method takes into consideration, also the dimensional interrelations of the trunk (a-a, sst-sy, the transversal diameter of the chest, ic-ic etc.). Of importance is equally the investigated ratio of the length of the lower extremities to the total body height.

The method of Škerlj, Brožek and Hunt is based, on the contrary on a visual assessment of the amount and localization of subcutaneous

fat tissue. It is well known that in human beings approximately one half of the total body fat is situated subcutaneously, but its distribution is mostly not uniform. Therefore we believe that a more estimation of its amount and more conspicuous accumulation might be exposed to marked subjective errors, and that the use of assessment for the determination of the constitutional type is rather problematic (Petrásek-Hajniš-Misiková-Loubová, in preparation). The drawback of this method consists in the fact that it does not take into consideration body height and weight. This is conceivably due to the purely morphognostic character of this method, yielding quick immediate results, in particular during field typologic studies, when an anthropometric investigation is not possible.

We have attempted to eliminate, at least partially, the subjective bias, associated with the use of the Škerlj, Brožek and Hunt Method of typing by the use of the above mentioned circumference measurements. We have used the Method of Škerlj, Brožek and Hunt, which was previously applied exclusively at females, for the determination of somatotypes of males. However, it should be stressed once more that its use represented merely an attempt and that its results were not altogether satisfactory. The use of a method of visual examination for the determination of constitutional types of males, in a similar way as by Škerlj, Brožek and Hunt's procedure, would be possible only after an extensive study of a large series of males. This study should be concerned with the peculiarity of the distribution of subcutaneous fat, as well as with the interrelations between the bony framework, muscles and fat. Further it would be obviously necessary to devise a new typologic nomenclature, since the use of some terms applied in the typing of females is not adequate for males.

We are well aware of the fact that the use of three grades of circumferential dimensions based on the value of standard deviation, in spite of the objectivity attained, is associated with some problems. The circumference values are most probably dependent not only on the amount of subcutaneous fat and on the robustness of the bony framework, but also on body height. Therefore a correction of the values according to body height appears valuable. The relation between the height of the muscle relief and the thickness of subcutaneous fat in individual parts of the body according to age, has not yet been elucidated as well.

CONCLUSIONS

1) The comparison of the frequency of individual somatotypes is associated with great difficulties. This is due both to the distinct typologic terms and to the differing number of types in these two typologic

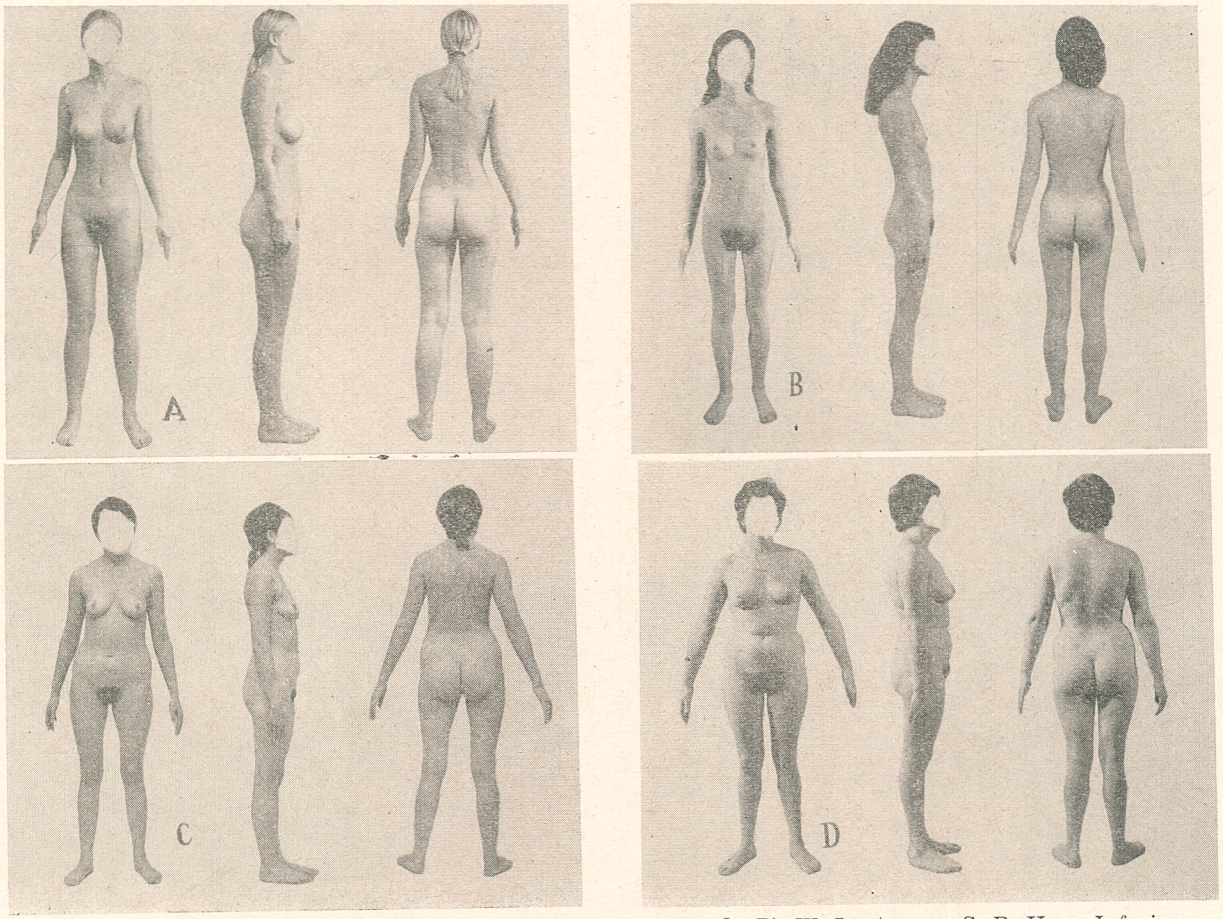

Fig. 1. A) Wanke — Leptosom, Škerlj-Brožek-Hunt — Normal; B) W.-Leptosom, S.-B.-H. — Inferior; C) W — Lepto-mesosom, S.-B.-H. — Normal; D) W. — Messo-pyknosom, S.-B.-H. — Inferior

methods. Since, for some types, there is no analogous type of somatic build in the other compared classification, any attempts of a comparison are quite futile.

2) This total lack of comparability, or a highly limited and difficult comparison of the results obtained, is due to the widely differing principles of the two methods.

While in agreement with correct and established notions, the determination of the constitutional types by Wanke's method is based on the interrelations of body dimensions and further takes into consideration the relation between somatic height and weight, as well as the lenght of the lower extremities. The method devised by Škerlj, Brožek and Hunt is based solely on visual inspection and thus is exposed to subjective bias. The assessment of an excessive accumulation of subcutaneous fat, regardless of other facts, is problematic for two reasons: in the first place, it is not possible to provide evidence that the structures believed to represent an accumulation of fat in a part of the human body actually consist of fat, and secondly, as it follows from our so far unpublished results, the amount of an inactive somatic mass is not necessarily related to the constitutional type (Petrásek et al., in preparation).

3) The method of Škerlj, Brožek and Hunt is not adequate for the typing of males. It was devised for the typing of females and is in no agreement with the somatic build in males.

4) The method of Škerlj, Brožek and Hunt is based on visual examination and therefore is certainly exposed to many subjective errors. It might be useful as supplementary method for the determination of somatotypes when no anthropometric study is available, in particular for field studies. However, in laboratory studies, its use is not justified.

On the contrary, we consider Wanke's Method, especially in our modification and on substitution of the index of the truncal form for the thoracic index (Hajniš et al., 1974), as the method of choice. We warmly recommend its use in this modified form, as of a simple and objective method yielding results of which can be readily compared with those of variety of other methods.

LITERATURE

1. Hajniš K., Petrásek R., Loubová J., Misiková J., *The frequency of somatotypes in the Czech adult population.* Z. Morph. Anthr., 1974, 66, 20 - 30. * 2. Martin R., Saller K., *Lehrbuch der Anthropologie.* G. Fischer, Stuttgart, 1957. * 3. Petrásek R., Hajniš K., Loubová J., in preparation. * 4. Škerlj B., Brožek J., Hunt E. E., *Subcutaneous fat and age changes in body build and body form in women.* Am. J. Phys. Anthr., 1953, 11, 577 - 600. * Wanke A., *Zagadnienie typów somatycznych.* Przegl. Antrop., 1954, 20, 64 - 104.

PORÓWNANIE METODY SOMATOTYPOLOGICZNEJ WANKEGO Z METODĄ ŠKERLJA — BROŽKA — HUNTA

K. HAJNIŠ, R. PERÁSEK, J. GOUBOVÁ

Różnorodność stosowanych w typologii somatycznej metod powoduje, że wyniki różnych opracowań są na ogół nieporównywalne. Autorzy przedstawionej pracy zastosowali dwie z tych metod: Wankego i Škerlja — Brožka — Hunta, do wydzielenia typów somatycznych w tej samej grupie ludzi. Materiał stanowili mieszkańcy Pragi w wieku 18 - 33 lat, w liczbie 93 kobiet i 59 mężczyzn. W wyniku opracowania okazało się, że użyte metody dają trudno porównywalne wyniki, przy czym pewne typy uzyskane jedną z metod nie znajdują odpowiedników w drugiej. Metoda Škerlja — Brožka — Hunta, zdaniem autorów, nie powinna być stosowana w somatotypologii mężczyzn. Ponadto, metoda ta zawiera zbyt dużo momentów subiektywnych wobec czego autorzy są zdania, że znacznie lepsze wyniki uzyskuje się — zmodyfikowaną przez nich — metodą Wankego.