



## MORPHO-FUNCTIONAL PECULIARITIES OF TWINS ENT – ORGANS

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### ABSTRACT

The work is devoted to the study of the analysis of twin pairs, interesting from a clinical point of view, concordant or discordant morpho-functional features of ENT organs.

Hereditary factors may be important in diseases caused by environmental influences, as they determine the degree of reactivity of the body. In order to assess the role of hereditary and environmental factors and learn the process of disease development, pathological changes in the functional and anatomical aspects of ENT organs in twins are still being studied.

*Keywords: Twins, monozygotic, dizygotic, concordance, discordance, intra-pair similarity, heredity.*

### RELEVANCE

Many domestic and foreign researchers have studied the genetics of otorhinolaryngological diseases [1]. However, at present we have only some information about deafness and hearing loss [2,3].

When studying the genetics of ENT diseases, some researchers used the twin method [6]. Meanwhile, this method provides more accurate information about the hereditary etiology of a particular pathology [5,3].

The twin method is based on the study of intra-pair differences and is of primary importance for understanding the relative role of heredity and environment in the formation of various features, structural abnormalities, widespread diseases in the population due to polygenic factors, and especially in the study of inherited diseases with low penetrance [7,13].

Hereditary factors can be important even in diseases caused by environmental influences, as they determine the degree of reactivity of the body. Therefore, in diseases caused by the influence of the environment, the frequency of matching the diagnosis in children of monozygotic twins may be slightly higher than in dizygotic ones, due to the same reactivity in the first and different in the second. However, the greater the role of heredity, the higher the frequency of matching the diagnosis of the disease in monozygotic and the greater the difference in the frequency of matching the diagnosis between monozygotic and dizygotic.

Unfortunately, only a few studies have been conducted on the analysis of twin pairs that are interesting from a clinical point of view, concordant or discordant in morpho-functional features of ENT organs, in general, for violation of auditory inference. Previously, using such a very accessible method of research as photographing, attempts were made to study various details of the external structure of ENT organs [8,9]. The researchers noted that the monozygotic inside the pair are usually more similar in a number of features of the nose shape than the dizygotic. So he found discordance of features of the structure of the external nose in 55% of dizygotic, while out of 31 pairs of monozygotic, only 8 pairs he found only small differences in the shape of the nose. According to their data, all monozygotic nose shape has an exceptional similarity, and in dizygotic

discordance is noted in 55 %. The size and shape of the mouth and the thickness of the lips have a large internal pair similarity in monozygotic than in dizygotic. No differences were observed between monozygous, while dizygous full gap was 40% of the investigated, not the full difference 25 %, and only the remaining 25% of patterns were similar on these characteristics. As for the nasal cavity, some researchers also found a noticeable internal pair similarity [10, 11].

Ears are also a very important feature for judging similarity. The outer ear has a number of morphological features that can easily be fixed, which makes it possible to accurately comparing ear shells. The length and width of the auricle, the degree of protrusion, the shape and location of the whorl of ear and against the whorl, as well as the earlobe are due to the dominant form of heredity mainly on the father's side. However, various variations of the shape of the curl and increment of the ear lobe are direct signs of a recessive nature.

The so-called Darwinian tubercle on one or two sides and probably can be considered as a mono-dimensional and non-permanently dominant hereditary trait [8,9,12,]. Some researchers, studying a number of morphological features of the auricle (Darwin's tubercle, fossa at the upper edge of the outer ear, and others) also noted greater intra-pair similarity in monozygotes, while in dizygots the difference was noticeably greater. Studies [10,13,14] have shown that the tympanic membrane in its histological structure has a slightly greater intra-pair similarity in monozygotes than in dizygotes.

However, a more detailed study of the anatomical features of the face and ENT organs on a sufficiently large number of twins in comparison with general population studies has not yet been conducted in general and in Uzbekistan in particular. The implementation of these studies will make it possible not only to assess the relative influence of these factors in determining a particular trait, but also to make it possible to judge the impact of the factor of multiple births on the frequency of occurrence of neural sensory hearing disorders in them. This question is related to the fact that various abnormalities and malformations in twins are somewhat more common than in the general population.

The purpose of the study: to study intra-pair differences in morpho-functional features of the face and ENT organs in monozygote and dizygotic twins.

## **MATERIAL AND METHODS**

These studies were conducted on 234 pairs of twins, of which 103 pairs were monozygous twins and 131 were dizygotic twins. There were 38 pairs of boys and 65 pairs of girls among monozygous twins, and 45 pairs of boys and 54 pairs of girls and 32 pairs of opposite-sex twins among dizygotic twins. The age of the examined children is from 6 to 14 years. The control group included 756 children of secondary schools.

The research began with a detailed study of the nature of complaints, objective examination and anamnesis data, performed general clinical and endoscopic methods of examination of ENT organs, determined hearing acuity and vestibular functions. If necessary, x-ray and CT examinations were performed.

## **RESULTS AND DISCUSSION**

Analysis of the most common abnormalities of the face and ENT organs in twins showed that in twins they were  $26.49 \pm 3.08\%$  compared to  $7.68 \pm 1.13\%$  of the control group ( $P.0,01$ ). In monozygotes, anatomical

destructions were more common  $20.94 \pm 1.66\%$  than in dizygotic  $5.56 \pm 1.58\%$ . In twins, significantly more often  $13.25\% \pm 1.28\%$  than in children of the control group  $0.71 \pm 0.35\%$ , there was a deviation of the nasal septum ( $P = 0.01$ ). Among monozygotes, the deviation of the nasal septum was observed in 31 children ( $7.76 \pm 1.08\%$ ), and among dizygotic in 21 ( $4.49 \pm 0.85\%$ ) children. According to this pathological feature, monozygotes were concordate in 20 pairs and only one pair was discordate, so the heritability coefficient  $H = 0.9$ . monozygotes were concordate in 6 pairs and discordate in 9 pairs and the heritability coefficient  $H = 0.4$ . Open bite in twins was also observed in a significant percentage of cases  $5.98 \pm 1.25\%$  compared to the control of  $0.54 \pm 0.31\%$ . The obtained differences are statistically significant ( $P = 0.01$ ). We have identified the difference on the open bite is statistically significant ( $P < 0.05$ ) and the comparative analysis of the characteristic data between monozygote and dizygous .

Table.

**Inside the paired ratio between the most common anomalies of the face and ENT diseases in twins**

Abnormalities of the structure of the face and ENT organs	Monozygote		Dizygote	
	Concordance	Discordance	Concordance	Discordance
Deviation of the nasal septum	20	I	6	9
Open bite	II	I	I	3
Protruding ears	8	-	-	-
Darwin's tubercle	9	-	-	-
Subtotal	48	2	7	12

Monozygote on the basis of this concordat was 11 pairs, and only one pair discharge time heritability coefficient  $H = 0.9$ . At the same time, concordance for open bite in dizygotes in only one pair, discordance was noted in 3 pairs of dizygotes the heritability coefficient  $H = 0.2$ . Protruding auricles were found among twins in 16 children ( $3.42 \pm 1.04\%$ ). Similarly, the percentage of children was observed in the control group ( $P = 0.05$ ). All of these children were monozygous and all were found to have an intra-pair concordance heritability coefficient  $H = 1.0$ . Signs as "Darwin's tubercle" was not observed among dizygot. They were monozygous in 18 children (9par), which is  $9.85 \pm 1.08$  versus  $1.96 \pm 0.59\%$  in the control ( $P = 0.05$ ).

The study of hearing in twins showed that the audiometric curves for air and bone conduction were within the normal range. In some cases, there were slight fluctuations in hearing loss at certain frequencies of the order of 5, less often 10 dizygotic twins. The analysis of audiometric curves revealed more intra-pair similarity in monozygotes. This applies to cases where the pathology of ENT organs is not detected during otoscopy, and in three pairs of monozygotes concordate for bilateral purulent otitis media. The heritability coefficient for these diseases was equal to 1.0.

In the study of vestibular function in twins, it was noted that all the examined children did not complain of balance disorders, staggering when walking and dizziness. The total analysis of vestibular samples showed that among monozygotes, concordate pairs with normal reaction were observed in a significant number of cases (69 pairs), which was 87%. Dizygotic concordate cases with normal vestibular response were significantly less (32% or 24 out of 73 pairs).

Reduced excitability of the vestibular analyzer was observed in 10 pairs of monozygotes of twins. Discordant monozygote pairs of twins with inhibition of the vestibular apparatus is not detected. In dizygots, inhibition of the vestibular reaction in 12 pairs. Among them, the concordat was 4 pairs, then 8 pairs as discharge time. The lack of excitability of the vestibular apparatus is not detected nor monozygote and dizygote twins.

## CONCLUSIONS

The greatest intra-pair similarity (concordance) of anatomical details of the ear shells and some features of the face and open bite in monozygotes (48par). The heritability coefficient in monozygotes was 9.6, while in the group of dizygots it was only 3.68, which indicates that the above-mentioned distortions of the face and ENT organs are determined mainly by genetic factors.

Study of twins ' hearing when analyzing audiometric curves revealed more intra-pair similarity in their monozygotes.

Normal vestibular function response has been observed in significant cases in monozygotes. Dizygotic concordate cases with normal vestibular response were significantly less.

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