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The Variations of Auricular Tubercle in Turkish People

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In this study, 202 ears of 44 male and 57 female volunteer students were examined in order to classify the variations of auricular tubercle of Darwin in a Turkish population. Ears were classified into five subtypes according to the existence and significance of Darwin's Tubercle. The relation of birth order and gender to the variation of auricular tubercle were also investigated in this study. No difference was found related to gender but birth order was found to affect the variations.

Key words: Darwin's tubercle, helix, auricle, variation, classification.

Introduction

Ear, our hearing and balance organ, has three components: outer ear, middle ear and inner ear. Auricle (outer ear) is formed by auricle and external acoustic mea. Middle ear is a pneumatic space in the petrose part of temporal bone. Inner ear contains the components that are related to hearing and balance [12].

At the embryological development state, the inner ear develops from the ectoderm, the middle and the outer ear develop from the branchial system. Auricle (outer ear) appears as six mesenchymal bulges on the 1st and 2nd pharyngeal arcs. These bulges, the half of which are located at both sides of external ear passage, then unite to form the permanent earlap [1, 11, 13].

The characteristics of auricle comes from the cartilage of the ear. The prominent rim of the auricle is called the helix. Helix begins from the point where the skin of ear is connected to the head and developes upwards and downwards. Where the helix turns downward behind, a small tubercle, the auricular tubercle of Darwin, is frequently seen in Fig. 2-6 [6]. In some people where the Darwin's tubercle is located the helix is not curled but bare and tense. This broads the upper part of the ear and causes it to be similar to that of some adult monkeys'. In some rare cases this curled part does not exist, with being broad and pressed down to backwards which causes it to look as if the margin has been cut. Also sometimes the upper part of the helix is sharply pointed, this is called apex auricle (Darwin) [10, 15, 17] (Fig. 1). As we can understand from this, Darwin's tubercle exist in many different types. This formation is similar to that of some sharp-eared mam-

mals [8]. This feature is called Darwin's tubercle, even though it was first described by Woolner, a sculptor. A diagram of this landmark appears in Darwin's The Descent of Man (1871) [3-http://www.gpnotebook.co.uk- http://uic.edu].

The fusion of earlap bulges is a complex process, for this reason frequently developmental abnormalities can be seen. Many of recessions, processes, channels, cavities exist on the external side of auricle. Darwin's tubercle is assumed by evolutionary biologists to be a "residual" of quadrupeds which had various shapes of ears and it has been carried to humans. This tubercle is very evident about the sixth month of fetal life when the whole auricle has a close resemblance to that of some adult monkeys, after that it becomes smaller [2, 15].

Auricular tubercle can be described as one of the relatively common simple traits found in humans and it's widely used as a landmark in many studies [5, 9, 14].

Aims

The tubercle is inherited as a dominant, but the expression (size) is quite variable (http://www.faculty.fairfield.edu). Its absence is inherited as a ressesive. Some induviduals may have it only on one ear (http://uic.edu). The aim of our study was to classify the variations of auricular tubercle in five subtypes and investigate their relations to gender and birth order in a Turkish population.

Material and Methods

The ears of forty-four male and fifty-seven female students of Trakya University Medical Faculty were examined in this study. Students were randomly chosen and they were asked about their ages and birth orders. Afterwards Darwin's tubercle in both ears were recorded as one of the subtypes and a single sample of each subtype was monitorized with a digital camera. These subtypes include:

1 =Undeveloped Darwin's Tubercle
2 =Semi-developed Darwin's Tubercle
3 =Fully-developed Darwin's Tubercle
4 =Very significant Darwin's Tubercle
5 =Multiple Darwin's Tubercle

Subtype 1 = Undeveloped Darwin's Tubercle:
In this type no Darwin's tubercle was seen on the helix.

Subtype 2 = Semi-developed Darwin's Tubercle
There was a semi-developed sized Darwin's tubercle in this subtype but still it was not easily seen.

Subtype 3 = Fully-developed Darwin's Tubercle
In this subtype Darwin's tubercle was easily found on helix but was not so clear as to be seen from half a meter away.

Subtype 4 = Very significant Darwin's Tubercle
Darwin's tubercle was very significant and even from a meter away it could easily be seen.

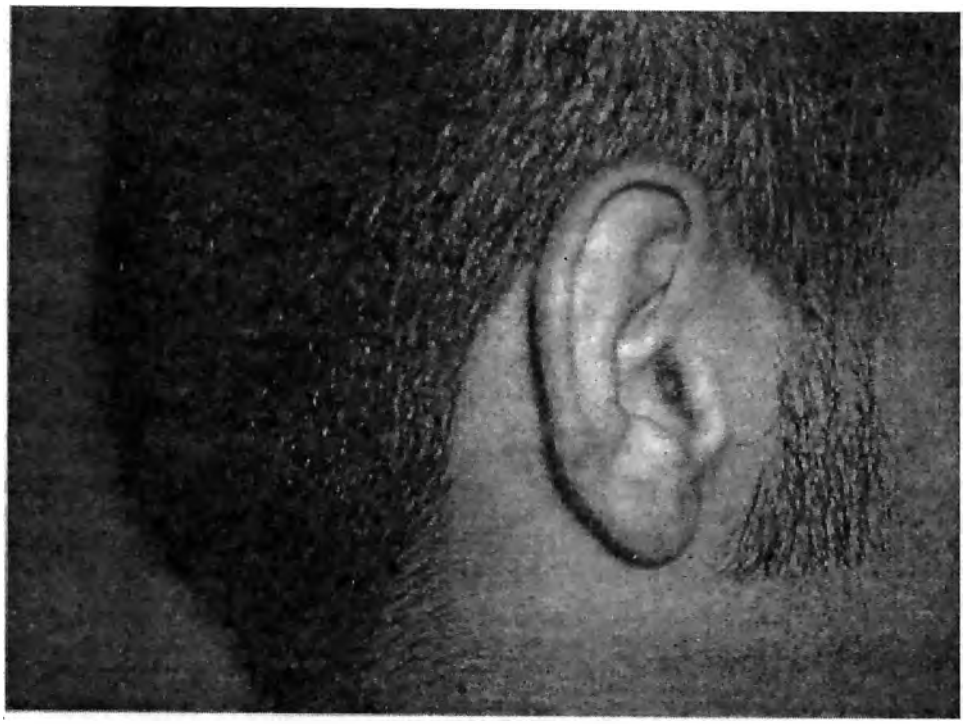

Fig. 1. Undeveloped Darwin's Tubercle

Fig. 2. Semi-developed Darwin's Tubercle

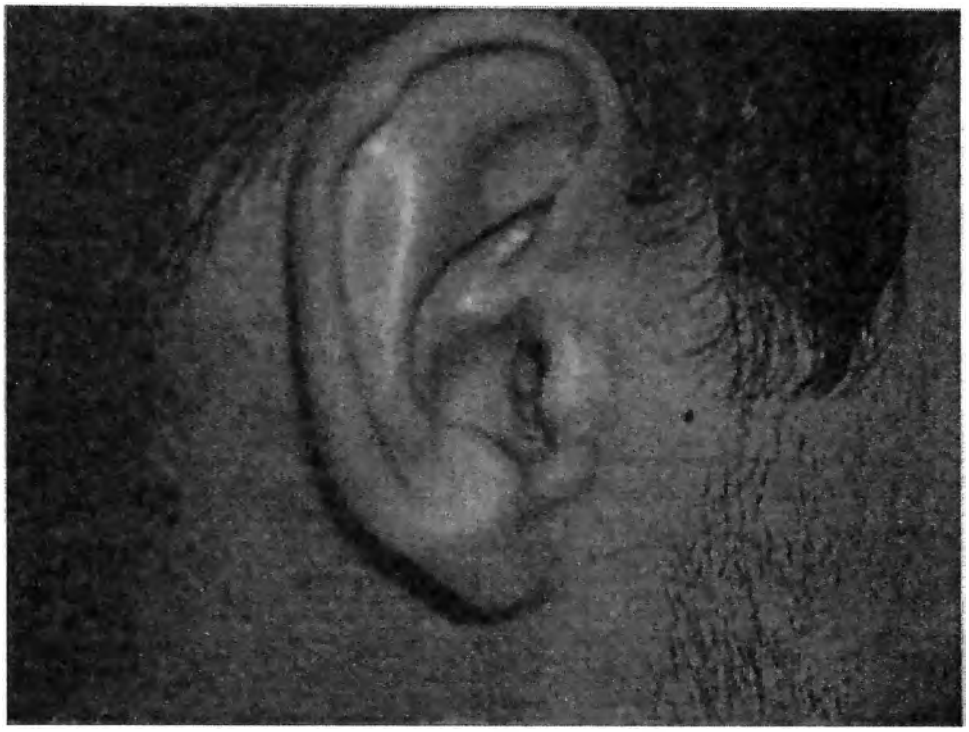

Fig. 3. Fully-developed Darwin's Tubercle

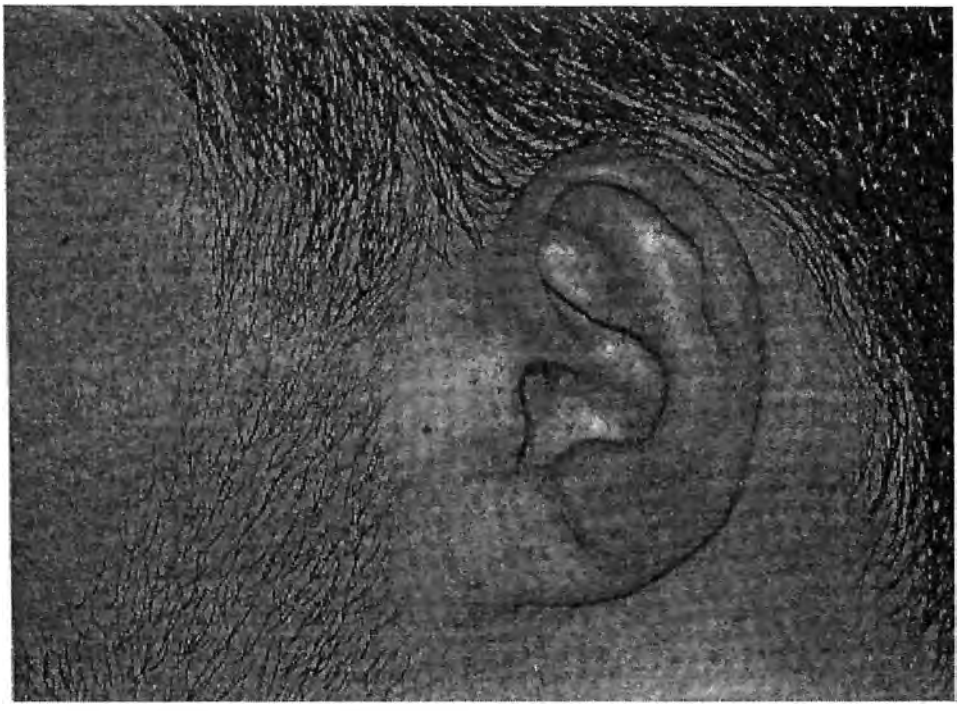

Fig. 4. Very significant Darwin's Tubercle

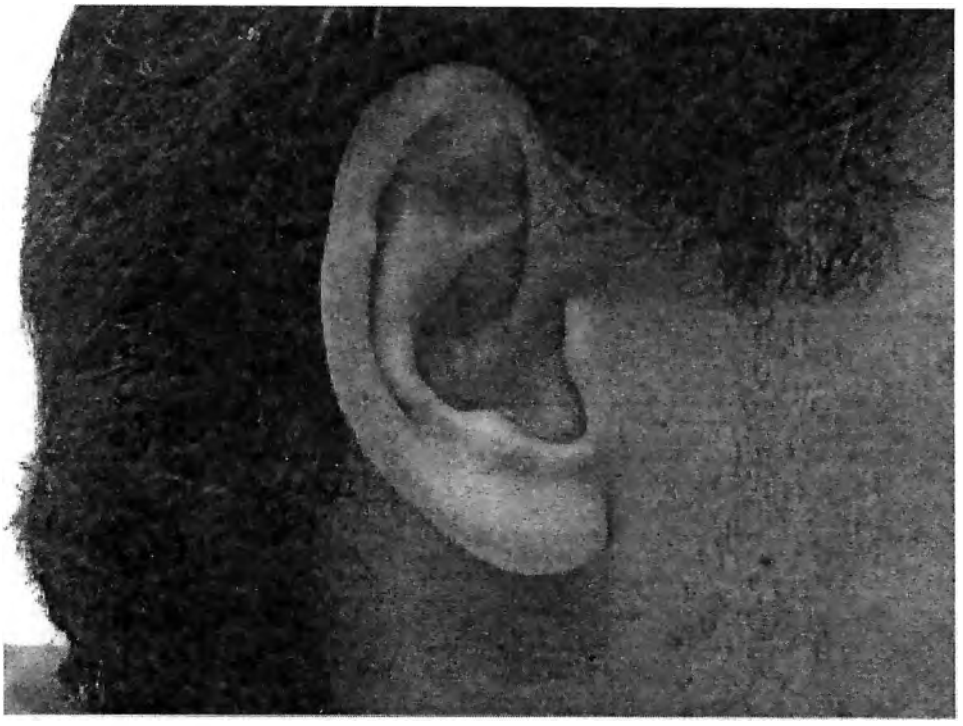

Fig. 5. Multiple Darwin's Tubercle

Fig. 6. Apexauricle. spg

Subtype 5 = Multiple Darwin's Tubercle
In this subtype more than one Darwin's tubercles were seen.

Statistical analysis was performed with SPSS 10.0 for Windows, $p<0.05$ was considered statistically different. Spearman's sho correlation test was used to perform the statistics.

Findings

There was no significant difference related to birth order in variation of right auricular tubercle ($p>0.05$). Significance occurred in left auricular tubercle ($p<0.05$). No Darwin's tubercle was the most frequent in first children. Undeveloped Darwin's tubercle was the secondly most frequent. The third, fourth, and fifth parameters were mostly frequent in first children also. There were fifty-three first children and the being first child was the most frequent. In second children the first parameter was significantly more frequent, others did not have any significance in the existence of auricular tubercle. Neither right ($p>0.05$) nor left ear had any difference related to gender. On both sides it was homogene and had no difference related to birth order. In both genders there was positive relation in left and right auricle and increase in one auricle affected the other which caused the tubercle of the opposite one to increase too.

Discussion

In our study we investigated the existence of auricular tubercle in a Turkish population. We subtyped the existence according to our findings.

Cephaloscopy, a technique used for classification of the head according to proper points [16].

In an animal study about the role of excessive doses of vitamin A during pregnancy, it was found that the primary target for retinol-induced dysmorphogenesis was the craniofacial region. In the same study six of the eight malformed fetuses exhibited unilateral or bilateral ear defects which consisted of hypoplasia of some areas of ear derived from the first pharyngeal arch (helix, crus of helix) or second pharyngeal arch (auricular tubercle, crura of antihelix, lobule, and antitragus). Although we did not study its effects, this data lead us to think besides the genetic affects the variation of auricular tubercle might be a result of the variable vitamin A consumption during pregnancy [7]. But we believe that further studies on this topic are still needed and for further studies on this topic our classification of the variations of auricular tubercle is going to be helpful.

With this study we wished the classification of auricular tubercle to be a premiss both to clinical anatomy and to anthropology.

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