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## A STUDY OF SOME MORPHOGENETIC TRAITS AMONG THE ESAN ETHNIC GROUP OF NIGERIA

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### ABSTRACT

**Background:** Genetic variability is a common feature of many organisms. The existence of genetic variation in man is caused by many factors along with selection, migration, gene flow and genetic drift. Human genetics are known as hereditary traits, these hereditary traits include the dominant and recessive traits in humans. Most of the genes are transmitted in the Mendelian pattern and a few are transmitted through the non-Mendelian pattern.

**Objective:** To show variation pattern in earlobe attachment, hair line distribution and presence or absence of cheek dimples and to determine prevalence of these traits among the Esan ethnic group of Southern Nigeria.

**Design:** Descriptive study.

**Setting:** The target populations for this study are the Esan ethnic group of Southern Nigeria. Esan land is bordered to the south by Benin City, to the east by Agbor City, to the north by Etsako and to the west by River Niger.

**Subject:** A simple random sampling technique was used to select 400 volunteered subjects (176 males, 224 females). They were between the ages of 17-60. Their parents and grandparents were from Esan backgrounds. Data on cheek dimple (present or absent), widow's peak or straight hairline and earlobe attachment was gathered.

**Result:** Results showed 12.5% of Males and 21.3% of females had cheek dimples while 31.5% of males and 34.7% of female had no dimple. 29.0% Males and 40.0% females had unattached earlobe while 15.0% Males and 16.0% females had their earlobes attached. Results for widow's peak showed 14.7% males and 16.5% females had widow's peak while 29.3% males and females 39.5% didn't have a peak. The chi-squared analysis of variance showed that there is a no significant difference between gender for earlobe attachment, hair line variation and cheek dimple ( $p > 0.05$ ).

**Conclusion:** The study concluded that these traits varies in the population but do not vary with gender.

### INTRODUCTION

Morphology traits are a special structural feature in an organism that is genetically inherited from parent to offspring (1). These traits differentiate organism of same species and brings about variation. Tongue rolling, widow's peak hairline, cleft chins, ear lobe attachment are some of these trait and are thought to be perfect examples of simple dominant and recessive patterns of inheritance, as a demonstration of how Mendelian genetics work they are clear, and easy to follow examples. Therefore in a given individual these

traits may be expressed or unexpressed (2).

This study thus attempt to look at the variation pattern of earlobe attachment, hair line presentation and occurrence of cheek dimple and there prevalence. The earlobe is the soft fleshy lower part of the external ear or pinna. It is the lower most portion of the human ear projecting below the antitragus. Earlobe average about two centimetres in length and elongate slightly with age (3). In humans, the ear lobe can be free hanging (unattached) or attached (4). The attached variety is sometimes classified as 'lobeless' (5).

Hairline is where the hair begins on the head. The Earline could be V shaped as in widow's peak or

straight. A widow's peak is a V shaped hairline across the top of the forehead behind which the hairs grow (4). In widow's peak hair growth on the forehead is suppressed in a bilateral pair of periorbital field. Normally this field join in the middle of the forehead so as to give a hairline that runs straight across. Widow's peak results when the point of intersection on the forehead of the upper perimeter of these fields is lower than usual (6).

Facial dimples are facial muscle deformity; they appear as small visible indentation on the surface of the skin. Dimples are highly prized because the face is highly visible and it is an important outlet for expressing thought and emotions beyond words (7). Dimples could be transient or permanent depending on factor responsible for its occurrence. Dimples are caused by a fault in the sub-cutaneous connective tissue that develops in course of the embryonic development. A variation in the structure of the facial muscle may also cause dimples.

The traits or characteristics of an organism are determined by genes. The genes for a particular trait come in two versions known as alleles. There are dominant alleles and recessive alleles and ear lobe attachment is thought to be a recessive trait, widow's peak a dominant trait and dimple autosomal dominant trait (2). The inheritance of facial dimples, unattached ear lobe and widow's peak follows the basic principles of the law of segregation and the law of independent assortment. These traits are inherited as autosomal dominant traits and people having the homozygous recessive genotype lack the ability to express these traits.

When one of the two parents expresses the trait, there is 25-50% likelihood of passing it to any of the

children; but if both parents have it, the probability doubles (50-100%) (8).

The aim of this study is to investigate the distribution pattern and prevalence of some morphogenetic traits (earlobe attachment, widow's peak and dimples) among the Esan ethnic group of southern Nigeria.

## MATERIALS AND METHODS

*Design of study:* This study adopted the descriptive research design. Data were collected by visual observations. The target populations for this study are the Esan ethnic group of southern Nigeria.

*Sample and sampling techniques:* Following ethical approval from the ethics and research committee of College of Medicine, Delta State University. Four hundred Esan subjects were randomly selected (176 males, 224 females) age ranged 17-60 for the study. Their parents and grandparents were from Esan backgrounds. Data on cheek dimple (present or absent), widow's peak or straight hairline and earlobe attachment (attached or unattached as described by Powell *et al.*, 1937) were obtained by observation after informed consent was given (9).

- *Widow's peak:* the front line of the hair projects down in the middle of the forehead and it is inherited as an autosomal dominant character.
- *Ear lobe attachment:* Ear lobes may be free or attached. free ear lobe is controlled by a dominant gene and attached ear lobe by a recessive gene
- *Dimple in the cheek:* depression of dimple in the cheek is inherited as an autosomal dominant character.

## RESULTS

**Table 1**  
*Distribution of some genetic traits in Esan population*

Sex	Dimple in cheek		Earlobe attachment		Widow's peak	
	present	absent	Attached	Unattached	Widow's peak	Straight hair line
Male (n =176)	50(12.5%)	126(31.5%)	60(15.0%)	116(29.0%)	59(14.7 %)	117(29.3%)
Female (n = 224)	85 (21.3%)	139(34.7%)	64(16.0%)	160(40.0%)	66(16.5 %)	158(39.5%)
Combined (n = 400)	135	265	124	276	125	275

From the table above, 50 males(12.5%) and 85 females(21.3%) had cheek dimples while 126 males (31.5%) and 139 females (34.7%) had no cheek dimples. Prevalence of cheek dimple in the population is 135/400 (33.75%). A higher percentage of the subjects had no dimple while only one third of the subjects had cheek dimple. Chi-square analysis of variance between sexes showed there no significant difference

in cheek dimple ( $P > 0.05$ ).

The table also revealed 116 males (29.0%) and 160 females (40.0%) had unattached earlobe while attached earlobe occurred in 60 males(15.0%) and 64 females(16.0%). Prevalence of unattached earlobe in the population is 276/400 (69.0%). Chi-square analysis of variance showed there is no significant difference between males and females with unattached earlobe

( $p > 0.05$ ). A higher percentage of the subject had unattached earlobe.

From the table, 59 males (14.7%) and 66 females (16.5%) had widow's peak while individuals with straight hair line were 117 males (29.3%) and 158 females (39.5%). Prevalence of widow's peak in the population is 125/400 (31.0%). Chi-square analysis of variance revealed there is no statistical difference between males and females with widow's peak ( $p > 0.05$ ).

### DISCUSSION

Variation in Earlobe attachment, widows' peak, dimples, among the Esan's of Edo state, Nigeria was investigated and results were presented in the table above. The table revealed 12.5% of males and 21.3% of females had facial dimples and those who had no facial dimples were 31.5% male and 34.7% of female. From this study a larger percentage of the population had no dimple (66.2%), cheek dimple was more frequent in females as compared to males though not statistically significant  $p > 0.05$ . This is in agreement with studies of Omotosho and Oladipo *et al.* (8,10). Omotoso, 2010 also observed the prevalence rates of cheek dimples in Southern Nigeria and put it at 29.4%, 37.0% and 37.7% in the South-West, South-South and South-East respectively. This is in agreement with his study as the prevalence of cheek dimple in the population studied (South-South Nigeria) is 33.75%.

The frequency of unattached earlobe was found to be more in the studied population (69%) and attached earlobe was (31%). The chi-squared analysis of variance showed that there is no significant difference between attached and unattached earlobe in males and females.  $P > 0.05$  is not statistically significant. This observation was not different from those of previous studies such as the studies of Emore *et al*, Singh *et al* and Williams *et al* where the incidence of free or unattached ear lobe were higher than that of the attached ear lobe (5,11,12). According to Emore, the high incidence of the unattached earlobe amongst females could be traceable to the cultural practices of piercing and the adornment with earrings as the weight of the earrings may contribute to the pulling down of the earlobe (5).

Results from widow's peak showed 31.2% (14.7% males and 16.5% females) had widow's peak while individuals who had straight hair were 68.8% (29.3% males and 39.5% females). Chi-squared analysis of variance showed that there was no significance difference within gender this observation is in agreement with the study of Odion-Obomhense *et al* (4) that found out that there was no significant variation in the incidence of widow peak occurrence amongst the male and female student populations of Delta State University Abraka, their studies showed that the population with the widows peak was more

than those who had a straight hairline. In dominant trait inheritance, there is no sex variation in the expression of traits. Inheritance of cheek dimple widow's peak and earlobe attachment follow the simple medelian law of inheritance as no difference was observed in both with gender (13).

In conclusion the study on cheek dimple, widow's peak and earlobe attachment varies from ethnicity to ethnicity. These possible inter-ethnic differences of this morphogenetic trait can be explained in terms of population characteristics, genetic and environmental factors. Data from this study will be useful in genetic analysis.

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