



**INHERITANCE PATTERN OF EARLOBE: A STUDY ON THE BENGALI HINDU  
BRAHMIN AND KAYASTHA CASTE GROUPS OF WEST BENGAL**

\*Dr. Doyel Dasgupta and Subhankar Saha

Department of Anthropology, University of Calcutta, 35 Ballygunj Circular Road, Kolkata 700019, West Bengal,  
INDIA.

\*Author for Correspondence: Dr. Doyel Dasgupta

Department of Anthropology, University of Calcutta, 35 Ballygunj Circular Road, Kolkata 700019, West Bengal, INDIA.

Article Received on 20/07/2015

Article Revised on 12/08/2015

Article Accepted on 05/09/2015

**ABSTRACT**

Present study aimed to investigate the inheritance pattern of earlobe attachment among the Bengali speaking Hindu Brahmin and Kayastha caste groups. Data were collected from 29 and 30 families from Brahmin and Kayastha caste groups respectively. Camera was used to take the pictures of ear lobe attachments. Participants/families had some selection criteria such as maiden caste of wife was same as the caste of husband; both the parents and all of the offspring were alive. The participants who had torn ear lobe or any deformities on lobe and those who used heavy ear rings were excluded from the study. Results showed that in Brahmin family, if one parent has attached and another one has detached earlobe then all of the offspring (irrespective of their sex) have attached earlobe. On the other hand, in Kayastha family if the earlobe attachments of one parent has attached and another one has detached then their offspring have three types of ear lobe attachments, both ear lobe attached, both lobe detached and one ear lobe attached and another lobe has detached. Present study concluded that inheritance pattern of ear lobe attachments is complicated.

**KEYWORDS:** ear lobe attachment, inheritance pattern, caste groups, West Bengal.

**INTRODUCTION**

Ear lobe is composed of tough areola and adipose tissues.<sup>[1,2]</sup> Ear lobes either remains directly attached to the lateral side of the head or detached hanging freely away from the lateral side of head.<sup>[3]</sup> The pattern of the attachment of earlobe is an inherited morphogenetic trait. However, controversy arises regarding the inheritance pattern of this trait. Studies stated that the trait followed the Mendelian monohybrid inheritance pattern.<sup>[4-6]</sup> The alleles for detached earlobe are dominant in nature and those for attached ear lobes are recessive in nature.<sup>[7-9]</sup> However, this finding was contradicted by other studies that identify it as a polygenic trait<sup>[10,11]</sup> or single gene with more than two alleles.<sup>[12]</sup>

Earlobe attachment is used to settle down the paternity dispute inheritance<sup>[13]</sup> and to explore the variation of ear lobe attachment within and between populations due to their variable genetic constitution.<sup>[4, 14-16]</sup> From India, some scattered studies have focused on the inheritance pattern of ear lobe attachments of different ethnic groups.<sup>[4,5]</sup> Under the circumstances, the present study aimed to investigate the inheritance pattern of earlobe

attachment among the Bengali speaking Hindu Brahmin and Kayastha caste groups.

**MATERIAL AND METHODS**

The present study was conducted among the two caste groups (the Brahmin and Kayastha) of West Bengal, a state located in the eastern part of India. Both of the groups were from same religious group- Hindu and belong to the same linguistic group- Bengali. We included those participants/families who had the following criteria - maiden caste of wife was same as the caste of husband; both the parents and all of the offspring were alive. The participants who had torn ear lobe or any deformities on lobe and those who used heavy ear rings were excluded from the study. Data were collected from 29 and 30 families from Brahmin and Kayastha caste groups respectively. Camera was used to take the pictures of ear lobe attachments. Pictures were taken from the lateral side of the head of the study participants. Before data collection, the study participants were informed about the voluntary nature of their participation and consent was obtained from them. The present study was conducted during April 2015 to June 2015.

## RESULTS

**Table: 1 Distribution of the earlobe attachment among the Brahmin caste group**

Mother	Father	No. of Family	Son			Daughter		
			Both ear attached	Both ear Detached	One ear attached and one ear detached	Both ear attached	Both ear detached	One ear attached and one ear detached
Both ear attached	Both ear attached	3	1 (100.00%)	0 (0.00)	0 (0.00)	2 (100.00%)	0 (0.00)	0 (0.00)
Both ear detached	Both ear detached	16	0 (0.00)	7 (100.00%)	0 (0.00)	0 (0.00)	9 (100.00%)	0 (0.00)
Both ear detached	Both ear attached	3	2 (100.00%)	0 (0.00)	0 (0.00)	1 (100.00%)	0 (0.00)	0 (0.00)
Both ear attached	Both ear detached	7	1 (25.00%)	3 (75.00%)	0 (0.00)	1 (25.00%)	2 (75.00%)	0 (0.00)

Table 1 shows that in case of Brahmin caste group, the if both the ear lobe attachments were attached or detached, then ear lobe attachments of all their offspring (irrespective of their sex) were attached or detached respectively. Moreover, if the mother of the participant had attached and the father had detached earlobe then 75% of the offspring (irrespective of their sex) had attached and 25% had detached earlobe. However, if the father had attached and mother had detached earlobe then all of the offspring (irrespective of their sex) (100%) had attached earlobe.

**Table: 2 Distribution of earlobe attachment of the Brahmin children**

Earlobe attachment	Total no. of children	No. of male children	No. of female children	Total
Both ear attached	8	4	4	27.58%
Both ear detached	21	10	12	72.41%
Total	29	14	15	100.00%

**Table: 3 Distribution of the earlobe attachment frequency among the Kayastha caste group**

Mother	Father	Number of Families	Son			Daughter		
			Both ear attached	Both ear Detached	One ear attached and one ear detached	Both ear attached	Both ear detached	One ear attached and one ear detached
Both ear attached	Both ear attached	8	7 (100.00%)	0 (0.00)	0 (0.00)	6 (100.00%)	0 (0.00)	0 (0.00)
Both ear detached	Both ear detached	14	0 (0.00)	7 (77.77%)	2 (22.22%)	0 (0.00)	5 (83.33%)	1 (16.66%)
Both ear detached	Both ear attached	4	2 (66.6%)	0 (0.00)	1 (33.30%)	2 (100.00%)	0 (0.00)	0 (0.00)
Both ear attached	Both ear detached	3	1 (50.00%)	1 (50.00%)	0 (0.00)	1 (50.00%)	1 (50.00%)	0 (0.00)

In case of the Kaystha caste group (table: 3) if the both the ear lobe of both the parents were attached or detached, then all of the their offspring (irrespective of their sex) had attached or detached earlobe respectively. On the other hand, if the father of the participant had attached and the mother had detached earlobe then 66.6% of male offspring had attached ear lobe (both ear) and 33.3% had one ear attached and another with ear detached earlobe, whereas 100% of female offspring had attached earlobe in both ear. Furthermore, if the mother had attached and the father had detached earlobe then 50% of the offspring (irrespective of their sex) had attached and 50% had detached earlobe.

**Table: 4 Distribution of earlobe attachment of the Kayastha children**

Earlobe attachment	Total no. of children	No. of male children	No. of female children	Total
Both ear attached	19	10	9	51.35%
Both ear detached	14	8	6	37.83%
One ear attached and one ear detached	4	3	1	10.81%
Total	37	21	16	100.00%

**DISCUSSION**

Present study stated that in Brahmin family, if one parent has attached and another one has detached earlobe then their all of the children (irrespective of their sex) either have attached earlobe or 25% have attached and 75% have detached earlobe. Thus, like other<sup>[5, 6]</sup> present study was also supported that ear lobe attachment is a Mendelian monohybrid trait. On the other hand, in Kayastha family if the earlobe attachments of one parent has attached and another one has detached then their children have three types of ear lobe attachments, (i) both ear lobe attached (51.35%), (ii) both lobe detached (37.83%) and (iii) one ear lobe attached and another one has detached (10.81%). As per Mendelian inheritance, the frequency of dominant i.e. the detached earlobe should be higher in heterozygous condition but here we see that the frequency of attached ear lobe is high. Moreover, there might be an existence of practicing exogamy among Kayastha family and the factors like ethnic, social and caste hierarchy are responsible for the occurrences of human variation of such morphogenetic trait.<sup>[10]</sup> Furthermore, present study is also corroborated with the other findings which pointed out that heredity of earlobe is complicated and no simple mode of inheritance could be established.<sup>[17-19]</sup>

We are aware about the limitation of the present study. Sample size is small. We did not analyze the pedigree of such families to observe the inheritance of their ear lobe attachment and considered only one generation.

**ACKNOWLEDGEMENT**

We are indebted to our study participants for their help and cooperation. We are indebted to our study participants for their help and cooperation. We would like to express our gratitude to Dr. Subha Ray, Professor of the University of Calcutta, Anthropology Department and Nadira Mallick, Research scholar of the University of Calcutta, Anthropology Department for improving the manuscript.

**REFERENCES**

1. Chummy S. Last's Anatomy Regional and Applied. 10<sup>th</sup> edition., New York; Churchill Livingstone., 1999.
2. Keith ML, Arthur DF. Clinical Oriented Anatomy. 5th Edition., Philadelphia; Lippincott Williams and Wilkins., 2006.
3. Azaria RMD, Adler NMD, Silfen RMD, Regev DMD, Hauben DJMD. Morphometry of Adult Human Ear lobe. A study of 547 subjects and clinical application. Plastic reconstruction surgery, 2003; 111: 2398-2402.
4. Mohanraju C, Mukherjee DP. Ear lobe attachment in an Andhra village and other parts of India, Hum. Hered, 1973; 23: 288-297.
5. Sharma A, Sidhu NK, Sharma MK, Kapoor K, Singh B. Morphometric study of ear lobule in northwest Indian male subjects. *Anat Sci Int.*, 2007; 82: 98-104.
6. Ordu KS, Didia BC, Egbunefu N. Inheritance Pattern of Earlobe Attachment amongst Nigerians. *GJHPA*, 2014; 2: 001-007.
7. Powell EF, Whitney DD. Ear lobe inheritance: an unusual three generation photographic pedigree chart. *Journal of Heredity*, 1937; 28: 184-188.
8. Dharap AS, Than M. Five anthroposcopic traits of the ear in a Malaysian population. *Anthropol Anz*, 1995; 53: 359-363.
9. Pandey BN, Jahangeer MD, Priyanka M. A morphogenetic study of Badhiya Muslims of Purnia District (Bihar), India. *Int J of Life Sciences*, 2013; 1: 233-238.
10. Dutta P, Ganguly P. Further observations on ear lobe attachment. *Acta Genet Statist Med*, 1965; 15: 77-86.
11. Palkovich AN. Science, Race and Politics. Proceedings of the amazing meeting. James Randi Educational Foundation., 2006.
12. Wiener AS. Complications in ear genetics. *Journal of Heredity*, 1937; 28: 425-426.
13. Hugo P, Eliaman Q, John K. History of evolution and its concept. 6th ed., New York City; 2003.
14. Jadav JS, Jadav AS, Chadha PC. Studies on Morphogenetic and Behavioural Traits in Five Endogenous Groups of Haryana. *Journal of Pan African Studies*, 1954; 2: 329-332.
15. Purkait R. Ear biometric: An aid to personal identification. *Anthropologist Spl*, 2007; 3: 215-218.
16. Chadha P, Sandhu SK. A study on distribution of morphological, behavioral and serological traits in three endogamous groups of scheduled castes in Jammu and Kashmir. *Cibtech J. Zool*, 2013; 2:47 - 50.
17. Suzuchi A. Genetic studies of the human ear lappets: on the inheritance of the lobules auriculæ. *Jpn J Hum Genet*, 1950; 25: 157
18. Gates, RR. Etude sur le croisement de races (111 Nouvelles observations concernant les oreilles, en particulier les lobes). *J. Human Genet*, 1954; 4: 69-74.
19. Rao VR. Earlobe Attachment: Quantitative assessment Ind, *J phys Anthropol Human. Genet*, 1986; 12: 185 - 200.