

Tongue Rolling, Folding, Cheek Dimple and Chin Cleft; Study of a Morphogenetic Traits in Quetta Population

¹Rabia Razzaq, ¹Safoora Kanwal, ¹Shandana, ¹Nabeela Tariq and ²Naheed Sajjad

¹Department of Zoology, Sardar Bahadur Khan Women's University Quetta, Pakistan

²Department of Biotechnology, Sardar Bahadur Khan Women's University Quetta, Pakistan

Abstract: In Balochistan province few reports regarding morphogenetic trait have been published. So, the study aimed to determine the incidence of tongue rolling, tongue folding, facial dimple and chin cleft in Quetta city of Pakistan. A total subjects comprising of 1153 females and 847 males were observed for morphogenetic traits as tongue rolling and folding, cheek dimple and chin cleft from random population, 46% individual were capable to roll their tongue, out of which 43.54% were female and 49.35% were male. About 36.45% of the population has the ability to fold their tongue, out of which 34% were female and 38.5% were male. The survey showed that 29.2% of the population had facial dimples, out of which 29.7% were females and 28.6% males. About 25.9% subjects have chin cleft, out of which 20.8% were female and 32.58% male subjects. Ethnicity was also observed. Chi-square test showed an association of ethnicity with these morphogenetic traits. In conclusion, all the studied morphogenetic traits were found to be present in the different ethnic groups' resident in Baluchistan province with variable prevalence.

Key words: Chin cleft • Facial dimple • Morphogenetic trait • Tongue folding • Tongue rolling

INTRODUCTION

Human population provides an exclusive opportunity to study the morphogenetic variation among the endogamous populations living in different geographical and ecological circumstances [1]. Genetic variability is a common attribute of humans. The presence of genetic variation in man is controlled by many factors including assortment, migration, gene flow and genetic drift [2]. Humans contain hereditary traits including both dominant and recessive [3]. The tongue is a muscular organ used for verbal communication, tasting and swelling [4]. Tongue movement survey first time has been conducted by Sturtevant in 1940 [5]. The inheritance of the ability to roll tongue sides meet at the top of the tube upwards to form a closed tube, is due to recessive gene and inability is due to a dominant gene [6, 7] while the ability to fold lateral edges of the tongue in U shape is reported due to significant dominant gene and a recessive gene is responsible for its inability [5].

Dimples are petite, appreciable indentations appear on the surface of the skin. It is inherited as dominant trait and may appear unilaterally or bilaterally in both sexes [8, 9]. Anatomically double or bifid zygomaticus muscle

are responsible for facial dimples. This facial muscle enclosure into dermis causes a dermal tethering effect [10, 11].

In lower jaw, Y shaped cleft present result of an underlying bony defect that is due to incomplete fusion of left right lower jaw bone during embryonic development [12]. Lebow and Sawin [13] first suggested that cleft chin was a genetic character; single recessive gene is responsible for cleft chin and a dominant for smooth chin [13].

The significance of morphogenetic traits genetic mechanism is still not clearly understood as it is seen to occur with erratic regularity in different populations and thus constructive in evaluating and analyzing evolutionary relation and classification as well [14]. The current study helps to highlight the prevalence of different morphogenetic traits in population of Quetta city.

MATERIALS AND METHODS

The study was approved by ethical review committee of the institute. All the subjects consents have been taken. The study was conducted in Quetta city from March to September 2014.



Fig. 1a: Roller tongue.



Fig. 1b: Non roller tongue.



Fig. 2a: Folder tongue



Fig. 2b: Non folder tongue

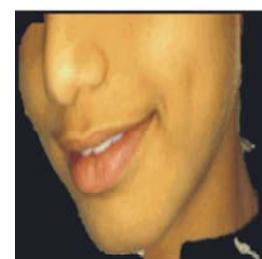


Fig. 3a: Dimple present



Fig. 3b: Dimple absent



Fig. 4a: Chin cleft present

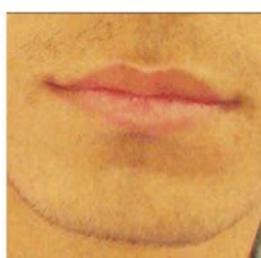


Fig. 4b: Chin cleft absent

Total number of subject was 2000 individuals, female 1153 and male 847 and age range was 3 to 74 yrs. Various morphological traits were analysed such as tongue rolling (Fig.1a) by turn up the lateral edges (Hsu, 1948) and tongue folding (Fig.2a) ability to fold lateral edges of the tongue in U shape by Sturtevant (1940) classified as positive (+) or negative (-) depending upon ability. The natural appearance of facial dimple (Fig.3a) and chin cleft (Fig.4a) also classified as positive (+) or negative (-) [15]. Statistical package for Social Sciences (SPSS) version 18.0 for windows (Chicago, IL,USA) was used for 5% level of significance.

RESULTS AND DISCUSSION

The study was conducted in Quetta city. Total number of subjects were 2000, female 1153 and 847 male. The distribution of morphogenetic traits amongst the population showed 920(46%) have ability to roll their tongue (Fig. 1a) out of which 502(43.54%) were female and 418(49.35%) male (Table 1). The incidence of tongue rolling of the study sample was high when compare with Ekpoma, Nigeria and Bihar, India with 100(51.8%) roller, 93(48.19%) non roller and 344(93.48%) roller 24(6.52%) non roller respectively that show dissimilarity with current study [16, 17]. Nigerian Urhobo and Kacharis of Assam India showed similarity with present study and observed more female were tongue roller with the ratio of 48 and 32(35.6%) then the male 39 and 34(27.2%) respectively [18, 19]. South Nigerian and Snowal Kacharis of Assam India claimed dissimilarity with current study who revealed that more male were roller 104(30.8%) and (54.94%) then female 89(26.4%) and (10.75%) respectively [14, 20].

On the other hand the present study showed low percentage of subjects have ability to fold tongue (Fig.2a), 729(36.45%) out of which 403(34%) female and 326(38.5%) male (Table 1). Out of 368 tongue folder were show high frequency 256(69.75%) against non folder 112(30.43%) in district Bihar India which show dissimilarity with current study [17]. Tongue folding compared with in Nigerian Urhobo and AndharaPerdash India population were revealed that more female 61 and 26(28.8%) then the male 59 and 25(20%) which resemble with current study [18, 19]. Kacharis of Assam India study accomplished that tongue folder was observed more in male (79.12%) then the female (38.71%) which is dis-similar with current study [14].

The prevalence of facial dimple (Fig.3a) of present study was 584(29.2%) total in which 342(29.7%) were female and 242(28.6%) were male (Table 1). Facial dimples were observed in Greek children showed low frequency in male (12.7%) and high frequency in female (13.08%) reveals same results when compared with current study [9]. Another study conduct in south west Nigeria showed high frequency in female 66(13.2%) has dimple while male has low frequency rate 45(9.0%) [15].

In the current study the frequency of the chin cleft (Fig.4a) was 518(25.9%) out of which 240(20.8%) were females showing low frequency and 278(32.8%) male with high frequency (Table 1). Study conducted in south west Nigeria chin dimple more frequent in female 10(2.0%) as compared to male 8(1.6%) show dissimilarity with current study [15].

Table 1: Prevalence of morphogenetic traits in genders

Gender	Total	Tongue rolling		Tongue folding		Dimple		Chin cleft	
		Roller	Non roller	Folder	Non folder	Present	Absent	Present	Absent
FEMALE	1153 (57.65%)	502(43.54%)	651(56.46%)	403(34%)	750(65%)	342(29.7%)	811(70.3%)	240(20.8%)	913(79.2%)
MALE	847(42.35%)	418(49.35%)	429(50.65%)	326(38.5%)	521(61.5%)	242(28.6%)	605(71.4%)	278(32.8%)	569(67.2%)
TOTAL	2000(100%)	920(46%)	1080(54%)	729(36.45%)	1271(63.55%)	584(29.2%)	1416(70.8%)	518(25.9%)	1482(74.1%)
Chi square		$\chi^2=6.640, df=1, p=0.010$		$\chi^2 0.104$		$\chi^2 df=1, p=0.596$		$\chi^2 df=1, p=0.00$	

Table 2: Prevalence of morphogenetic traits in different ethnic groups

Ethnic group	Total	Tongue rolling		Tongue folding		Dimple		Chin Cleft	
		Roller	Non roller	Folder	Non folder	Present	Absent	Present	Absent
BALOCH	465(23.5%)	244(52.5%)	221(47.5%)	177(38.1%)	288(61.9%)	141(30.3%)	324(69.7%)	141(30.3%)	324(69.7%)
HAZARA	60(3%)	38(63.3%)	22(36.7%)	31(51.7%)	29(48.3%)	25(41.7%)	35(58.3%)	16(26.7%)	44(73.3%)
PATHAN	861(43%)	326(37.9%)	535(62.1%)	294(34.1%)	567(65.9%)	217(25.2%)	644(74.8%)	182(21.1%)	679(78.9%)
PUNJABI	395(19.75%)	209(52.9%)	186(47.1%)	126(31.9%)	269(68.1%)	123(31.1%)	272(68.9%)	104(26.3%)	291(73.3%)
SARAIKI	62(3%)	30(48.4%)	32(51.6%)	34(54.8%)	28(45.2%)	30(48.4%)	32(51.6%)	21(33.9%)	41(66.1%)
SINDHI	55(2.75%)	29(47.3%)	26(52.7%)	26(47.3%)	29(52.7%)	25(45.5%)	30(54.5%)	23(41.8%)	32(58.2%)
URDU	102(5%)	44(43.1%)	58(56.9%)	41(40.2%)	61(59.8%)	23(22.5%)	79(77.5%)	31(30.4%)	71(69.6%)
TOTAL	2000(100%)	920(46%)	1080(54%)	729(36.45%)	1271(63.55%)	584(29.2%)	1416(70.8%)	518(25.9%)	1482(74.1%)
Chi square		$\chi^2 47.128, df=6, p=0.00$		$\chi^2 24.475, df=6, p=0.00$		$\chi^2 32.418, df=6, p=0.00$		$\chi^2 25.354, df=6, p=0.00$	

Data was also observed according to ethnic groups in which Pathan, Baloch, Punjabi, Sindhi, Saraiki, Hazara (Persian) and Urdu speaking were included (Table 2). Chi-square test was used to analyze the data at 5% level of significance. The different ethnic groups showed great variability in tongue rolling which were as: Pathan 314(36.5%), Baloch 243(53.3%), Punjabi 200(50.6%), Urdu speaking 36(35.29%), Saraiki 29(46.77%), Hazara 36(60%) and Sindhi 21(38.18%). The prevalence of tongue folding among different ethnic groups was as: 294(34.5%), Baloch 177(38.1%), Punjabi 123(31.13%), Urdu speaking 33(67.4%), Saraiki 34(54.83%), Hazara 30(50%) and Sindhi 23(41.8%). Facial dimple among Pathan 214(24.85%), Baloch 141(30.3%), Punjabi 120(30.4%), Urdu speaking 20(19.6%), Saraiki 30(48.4%), Hazara 25(41.7%), Sindhi 22(40%) were recorded. Frequency of chin cleft in ethnic groups subjects were observed as: Pathan 180(20.90%), Baloch 141(30.23%), Punjabi 101(25.56%), Urdu speaking 25(24.50%), Saraiki 20(32.25%), Hazara 16(26.66%) and Sindhi 21(38.18%).

In conclusion, tongue rolling trait is found highest in Pathan (43%), tongue folding and facial dimple is found highest in saraiki (58.4% and 48.4 respectively) while chin cleft was more prevalent trait among sindhi (41.8%).

ACKNOWLEDGEMENT

We would like to thank Ms. Hamida Ali for statistical assistance and to all the subjects who contributed in this study.

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