



## MORPHOMETRIC STUDY OF EAR CONCHA IN MEDICAL STUDENTS OF JAMMU & KASHMIR

### Anatomy

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### ABSTRACT

**INTRODUCTION:** Concha is the deepest depression in auricle which further leads to external auditory canal. Many current products are being designed to fit within the concha of the human ear so there is dire need to work on ear anthropometry especially concha measurements.

**MATERIAL AND METHOD:** The present study was conducted in SKIMS MCH, Srinagar on 50 subjects [25 females and 25 males] aged 18 to 22 year of Jammu & Kashmir, on simple random basis with prior informed consent.

**RESULTS AND CONCLUSION:** The study provides mean values of Conchal height , Conchal width and Conchal index in males and females of jammu and Kashmir .Sexual dimorphism was seen , Males having more Conchal height than females, while females have wider concha .Racial dimorphism was observed when present values were compared with previous studies.

### KEYWORDS

Conchal height, Conchal Width , Conchal index

#### INTRODUCTION:

Ear is an important organ contributing to the esthetics of the human face. The appearance of human face is influenced by size, shape, position and projection of the ear.<sup>1</sup> Human ear is divided into external ear, middle ear and inner ear. Earlap and meatus aucticus externus constitute external ear.<sup>2</sup> Concha is the deepest depression in auricle which further leads to external auditory canal. Many current products are being designed to fit within the concha of the human ear so there is dire need to work on ear anthropometry especially concha measurements. Anthropometric measurements of the human concha will allow for external ear devices to be designed and fabricated more accurately and in a more-timely manner.<sup>3</sup>

#### MATERIAL AND METHOD:

The present study was conducted in SKIMS MCH, Srinagar on 50 subjects [25 females and 25 males] aged 18 to 22 year of Jammu & Kashmir, on simple random basis with prior informed consent. Apparently healthy individuals without any Ear Abnormalities, Surgical Scars were included. All the measurements were taken by Vernier Caliper and all the measurements were taken in cm.

#### SOMATOMETRIC LANDMARK<sup>4</sup>

- Anterior Conchal Cymba (a): The most posterior point on the edge of the incisura anterior auris.
- Intertragal notch (b): The deepest point in the incisura intertragica notch.
- Tragus ©: The bump point of tragus.
- Posterior concha (d): The strongest antihelical curvature.

#### SOMATOMETRIC MEASUREMENTS:

- Conchal height: Anterior conchal Cymba (a) - Intertragal notch (b)
- Conchal width : Tragus (c) –Posterior Concha (d)

#### CONCHAL INDEX:

- Conchal width / Conchal height \*100.

#### OBSERVATION AND RESULTS:

**Table:1**

Mean and standard deviation of Conchal morphometry of all students

Dimensions	Right Ear	Left Ear	P value
Conchal Height	2.59 +/- 0.58	2.68 +/- 0.29	0.32
Conchal Width	2 +/- 0.39	2.03 +/- 0.18	0.6
Conchal Index	78.06 +/- 11.82	76.57 +/- 10.22	0.5

Table 1 shows mean of conchal height , conchal width and conchal index of all the students,. Conchal height and conchal width is seen slightly more on left side , while conchal index of right ear is more but the values being insignificant. We conclude that concha shows bilateral symmetry.

**Table 2: Mean And Standard Deviation Of Conchal Morphometry Of Male Students**

	Right Ear	Left Ear	P value
Dimensions			
Conchal Height	2.58+/- 0.27	2.54 +/- 0.24	0.58
Conchal Width	2.06 +/- 0.21	2.02 +/- 0.17	0.46
Conchal Index	80.65 +/- 11.48	80.12 +/- 9.27	0.8

Table 2 shows mean of conchal height , conchal width , conchal index in male students , all the measurements were seen higher in right ear but the difference of measurements between the two ears was insignificant.

**Table 3: Mean And Standard Deviation Of Conchal Morphometry Of Female Students**

	Right Ear	Left Ear	P value
Dimensions			
Conchal Height	2.6+/- 0.31	2.82+/- 0.27	0.01*
Conchal Width	1.94 +/- 0.16	2.04 +/- 0.19	0.04*
Conchal Index	75.47 +/- 11.59	73.02+/- 9.9	0.4

Table 4 shows mean of conchal height , conchal width and conchal index in female students ,conchal height and conchal width was seen more in left ear,the difference being significant.

**Table 4 Comparison Of Mean Values Of Males And Females Ear Concha**

	Right ear males	Right ear females	P value	Left ear males	Left ear females	P value
Dimensions						
Conchal height	2.58+/- 0.27	2.6+/- 0.31	0.8	2.54+/- 0.24	2.82+/- 0.27	0.0003**
Conchal width	2.06+/- 0.21	1.94+/- 0.16	0.02*	2.02+/- 0.17	2.04+/- 0.19	0.69
Conchal index	80.65+/- 11.48	75.47+/- 11.59	0.11	80.12+/- 9.27	73.02+/- 9.9	0.011*

Table 4 compares conchal morphometry of right ear of males with right ear of females and left ear of males with left ear of females. Mean of

Conchal width of right side of males is higher than the right ear of females the difference being significant. While conchal height of left side of females is higher than the males the difference being significant .Also males have significantly higher left ear conchal index than the females .

**DISCUSSION:**

The present study was devised to see if there is any difference in right and left ear conchal morphometry and further to rule out sexual and racial dimorphism , so that it can aid in making of ear instruments .

**Table 5 Comparison Of Mean Values Of Conchal Height And Conchal Width Of Right Ear With Previous Studies**

S.No	Parameter	Population	Mean (cm)±S.D Males	p-Value	Mean (cm)±S.D Females	p- Value
1	Conchal Height	Present Study	2.58±0.27		2.6±0.31	
		North east Indian	2.52±0.19	insignificant	2.44±0.23	0.03*
		North west Indian	2.67±0.26	insignificant	2.52±0.2	insignificant
		UP Indian	2.77±0.2	0.001**	2.48±.31	insignificant
2	Conchal Width	Present Study	2.06±0.21		1.94±0.16	
		North East Indian	1.76±0.13	0.0001***	1.73±0.19	0.0001**
		North West Indian	2.1±0.36	insignificant	1.7±0.13	<0.0001*
		North West (UP) Indian	1.98±0.22	insignificant	1.72±0.19	<0.0001*

Table 5 shows comparison of mean values of conchal height and conchal width of right ear of present study with previous studies done of North east Indian and north west Indian by P verma <sup>et al(5)</sup> and on UP Indian done by L Arora <sup>et al(6)</sup> . Mean of Conchal height of right side in males is almost similar to North west Indian and North east Indian , while in is more in UP Indians the difference being significant .while comparing Mean of Conchal height of right side of females of present

study with the previous studies we see North East Indians conchal height is less than seen in present study , the diffence being significant. While comparing the Conchal width we observe that in both males and females of present study conchal width of right side is more when compared with previous studies, concluding that width of concha is more in this region compared to other regions of India.

**Table 6 Comparison Of Mean Values Of Conchal Height And Conchal Width Of Left Ear With Previous Studies**

S.No	Parameter	Population	Mean (cm)±S.D Males	p-Value	Mean (cm)±S.D Females	p- Value
1	Conchal Height	Present Study	2.54±0.24		2.82±0.27	
		North east Indian	2.49±0.23	insignificant	2.41±0.19	0.0001*
		North west Indian	2.60±0.23	insignificant	2.41±0.18	0.0001*
		UP Indian	2.81±0.22	0.001**	2.49±0.3	0.0001*
2	Conchal Width	Present Study	2.02±0.17		2.04±0.19	
		North East Indian	1.68±0.10	0.0001***	1.7±0.22	0.0001**
		North West Indian	1.82±1.28	insignificant	1.72±0.17	<0.0001*
		North West (UP) Indian	2.0±0.26	insignificant	1.7±0.19	<0.0001*

Table 6 shows comparison of mean values of conchal height and conchal width of left ear of present study with previous studies done of North east Indian and north west Indian by P verma et al (5) and on UP Indian done by L Arora et al (6). Mean of Conchal height of left ear in males is almost similar with North east Indians and North west Indian , while it is significantly higher in UP Indians. While the Conchal width in left ear of males of present study is higher when compared to other studies ,the difference being significant with North east Indians. It is seen that both conchal height and Conchal width of left ear in females is higher when compared with previous studies , concluding that females of this region have larger concha when compared with other regions of India.

**CONCLUSION:**

1. Conchal morphometry shows sexual dimorphism, Males having more Conchal height than females, while females have wider concha in general .
2. Conchal morphometry show bilateral symmetry, both conchal height and conchal wight of all students is slightly more in left side than right but the difference is insignificant.
3. Conchal morphomerty shows racial dimorphism, it is seen that females of present study (J&k region) have larger and wider concha when compared to females of North west India , North east India and UP India. Males of present study have wider concha in general,the difference being significant with North east Indians, While males of this study have less conchal height when compared to UP Indians.

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