



Significance of Auricular Index in Sex Determination

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Citation this Article: Dr. Mahaveer Choyal, Dr. Guru Sharan Koodi, Dr. Shailendra Khichi, "Significance of Auricular Index in Sex Determination", IJMSIR- August - 2021, Vol – 6, Issue - 4, P. No. 123 – 125.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: The objective of present study is to determine the significance of auricular index in sex determination

Methods: Descriptive Observational Cross-sectional study conducted at Department of Forensic Medicine and Toxicology, Dr. S. N. Medical College, Jodhpur, Rajasthan (India)

Results: The mean maximum auricular index of sacrum in males is (55.53 ± 4.03) and in females (54.06 ± 7.78) . Calculated range for males is $(43.44-67.85)$ and Demarking point is >77.23 . Calculated range for females is $(30.72-77.23)$ and Demarking point is <43.31 . 'P'- Value is 0.220 which is considered to be statistically non- Significant. (0%) of male and (14.28%) female bones identified by DP of AUI.

Conclusion: Since sacrum is a component of pelvic girdle with Anatomical difference between the two sexes, it itself becomes important for identification of sex in human skeleton system. The study will be useful for the anatomist, anthropologist & experts in the forensic medicine for accurate sexing of sacra & various other clinical tenacities. The auricular index is most reliable in sexing of sacra.

Keywords: Sacrum, Sex, Index

Introduction

It has long been customary among anatomists, anthropologists and forensic experts to judge the sex of the skeletal material by non-metric observations. Lately, sexual divergence has been based upon actual measurements in different bones. Though sacrum is often considered to be an important bone while dealing with sex differences in skeletal material, there is paucity of metrical data available for this bone.

Metrical study of sacrum has been done by various authors Jit and Singh advocated the demarking point, which identify the sex with 100% accuracy.¹ Singh and Gangrade have reported that even within the same general population, mean value may be significantly different in bones from different zones. Singh and Singh have shown that demarking point should be calculated separately for different regions of population because the mean of a parameter differs in values in different regions.^{2,3}

Materials and method

Study setup: Department of Forensic Medicine and Toxicology, Dr. S. N. Medical College, Jodhpur, Rajasthan (India)

Study design: Descriptive Observational Cross-sectional study

Study duration: February 2018 to November 2018.

Sample size: The total 110 sacral bones were included in our study, after fulfilling inclusion & exclusion criteria. Adult dry sacral bones collected from various Anatomy departments of Dr. S. N. Medical College, Jodhpur, SMS Medical College, Jaipur, S. P. Medical College, Bikaner, J. L. N. Medical College, Ajmer. Further bone samples were divided into two sub-groups, which include 54 males and 56 females respectively.

Inclusion criteria

- Intact sacral bones available in Dept. of Forensic medicine and toxicology and dept. of Anatomy various Medical Colleges of Rajasthan.
- Only adult human sacrum bones are included.
- Fully ossified sacrum bones are included.
- Labeled sacrum bones are used.

Exclusion criteria

- Sacral bones exhibiting some pathology.
- Incomplete sacral bones.
- Deformed sacral bones.
- Unlabelled sacral bones.
- Sacral bones having wear & tear.
- Sacral bones showing lumbriation or with sacralisation of lumbarvertebrae.

Result

Table 1: Auricular Index

	Sex	N	Mean	Std. Deviation	Std. Error Mean	Calculated Range=mean±3 SD	Demarking point	% of bone identified by D.P.
AUI	M	54	55.53	4.03	0.55	43.31- 67.85	>77.23	0
	F	56	54.06	7.78	1.04	30.79-77.23	<43.31	14.28

The mean maximum auricular index of sacrum in males is (55.53± 4.03) and in females (54.06±7.78). Calculated range for males is (43.44-67.85) and Demarking point is >77.23. Calculated range for females is (30.72-77.23) and Demarking point is <43.31. 'P'- Value is 0.220 which is considered to be statistically non- Significant. (0%) of male and (14.28%) female bones identified by DP of AUI.

Discussion

Males: In our study the mean value of auricular index is (55.53); the calculated range (43.44- 67.62); The demarking point is >77.40.

Females: The mean value of auricular index is (54.06); the calculated range (30.72-77.40); the demarking point is <43.44.

Sacrum with auricular index of sacrum above (77.40) is definitely a male and less than <43.44 is definitely a female.

'P'-value of auricular index is 0.220 which is >0.05 shows non- significant. Percentage of bone identified by DP is (14.28%) female bones & (0%) males.

Studies of Renuka BA (2012) was found that the mean value for male was (52.07) and for female (45.18) which is lower as compared to our study.⁴

Joshi UU (2016) Maharashtra studied that the mean value for male was (56.48) and for female (51.50) which is similar in male, while lower among females than our study.⁵

Mishra SR (2003) found that the mean value for male was (59.78) and for female (51.69) which is more in male and less in female than our study.⁶

Conclusion

Since sacrum is a component of pelvic girdle with Anatomical difference between the two sexes, it itself becomes important for identification of sex in human skeleton system. The study will be useful for the anatomist, anthropologist & experts in the forensic medicine for accurate sexing of sacra & various other clinical tenacities. The auricular index is most reliable in sexing of sacra.

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