|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2019: 79.34
Original Research Article
Volume 5, Issue 9; September: 2021; Page No. 91-92

SIGNIFICANCE OF SACRAL INDEX IN SEX DETERMINATION

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Article Info: Received 20 July 2021; Accepted 21 August 2021
DOI: https://doi.org/10.32553/ijmbs.v5i9.2191
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Conflict of interest: No conflict of interest.

Abstract

Background: The objective of present study is to determine the significance of sacral 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 sacral index of sacrum in males is (99.68± 7.15) and in females(109.86±8.72). Calculated range for males is (78.23-121.13) and Demarking point is <83.70. Calculated range for females is (83.70-136.02) and Demarking point is >121.13. 'P'- Value is 0.000 which is considered to be statistically highly significant.Bone identified by DP is (27.77%) males and (33.92%) females.

Conclusion: Since sacrum is a component of pelvic girdle with Anatomical differencebetween 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 sacral index is most reliable in sexing of sacra.

Keywords: Sacrum, Sex, Index

Introduction

The best indicators of sex in the skeleton are to be found in the pelvis. This is because one of the major biological differences between men and women, that of having babies, largely determines the shape of that part of the body. This can be seen that from the sacral index, and sex can usually be determined even if part of the pelvis is destroyed. The ability to determine sex from unknown skeletal remains is vital, and methods to do this on the various bones of the human skeleton have been researched extensively. [1,2]

Many researchers have emphasized the need for population specific data for methods which are based on measurements, as there are vast differences in body size in various populations.

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

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

Exclusion Criteria

1. Sacral bones exhibiting some pathology.
2. Incomplete sacral bones.
3. Deformed sacral bones.
4. Unlabelled sacral bones.
5. Sacral bones having wear & tear.
6. Sacral bones showing lumbriation or with sacralisation of lumbervertebrae.

Result

Table 1: Sacral Index

	Sex	N	Mean	Std. Deviation	Std. Error Mean	Calculated Range = mean ± 3SD	Demarkingpoint	% of bone identified byD.P.
SI	M	54	99.68	7.15	0.97	78.23-121.13	<83.70	27.77
	F	56	109.86	8.72	1.16	83.70-136.02	>121.13	33.92

The mean **sacral index** of sacrum in males is (99.68± 7.15) and in females(109.86±8.72). Calculated range for males is (78.23-121.13) and Demarking point is <83.70. Calculated range for females is (83.70-136.02) and Demarking point is >121.13. 'P'- Value is 0.000 which is considered to be statistically highly significant. Bone identified by DP is (27.77%) males and (33.92%) females.

Discussion

The present study was conducted on sacrum bones in various medicalcolleges in Rajasthan. It has widely been recognized that skeletal characteristics vary amongpopulations and due to this regional variability that each population should have specific standards to optimize the accuracy of identification. Several studies using a variety of measurements and characteristics of the sacral bones have therefore been conducted from all over the world, with varying degrees of accuracy.[3]

The sacral index is lower in males than in females but in poorly preserved series they are virtually useless since these parts of pelvis are mostsusceptible to postmortem erosion. In the past many workers have evolved various metrical index for sexing [4]. Mac Laughlin & Bruce in 1986 attempt to improve method of skeletal identification through development of new methodof determining sex or fine tuning of existing method on various parts of skeleton so that he can be admissible in court. [5,6]

The reports concerning results and accuracies of studies in the metriccharacteristics of male & female sacra also seem to be quite different with some authors findings it usable and others less. [7]

Conclusion

Since sacrum is a component of pelvic girdle with Anatomical differencebetween 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 sacral index is most reliable in sexing of sacra.

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