ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 7, Issue – 2, March – 2022 , Page No. : 08 - 10

Significance of sacral index in estimation of sex at Bikaner Rajasthan

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Citation this Article: Dr. Sanjeev Buri, Dr. Pramod Kumar, Dr. O P Saini, Dr. Shalender Kumar, Dr. Rajendra Singh, "Significance of sacral index in estimation of sex at Bikaner Rajasthan", IJMSIR- March - 2022, Vol – 7, Issue - 2, P. No. 08 – 10.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Sacrum is a flattened triangular bone formed by the fusion of five sacral vertebrae. For the assessment of sexual dimorphism of human skeleton, pelvis has been used with great accuracy by anthropologists and forensic experts. The objective of present study is to determine the significance of sacral index in sex determination

Methods: Descriptive Observational Cross-sectional study conducted, 50 sacral bones were included in our study, after fulfilling inclusion & exclusion criteria. Further bone samples were divided into two sub-groups, which include 25 males and 25 females respectively

Results: The mean sacral index of sacrum in males is (97.63± 6.23) and in females(110.20±8.69). Calculated range for males was (79.36-121.30) and female was (84.69-132.01).

Conclusion: We concluded that for sexing of sacrum, the readings obtained by sacral index method were relevant and more significant

Keywords: Sacrum, Sex, Index

Introduction

Sacrum is a flattened triangular bone formed by the fusion of five sacral vertebrae. For the assessment of sexual dimorphism of human skeleton, pelvis has been used with great accuracy by anthropologists and forensic experts 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.[1]

This can be seen that from the sacral index, and sex can usually be determined even if part of the pelvis is destroyed. Sacrum, being an integral part of pelvis, has therefore gained importance. Among the various parameters of sacrum, sacral index is the most reliable one, calculated by the formula: Sacral index=max breadth x100/max length of sacrum.[2]

Materials and method

Study design: Descriptive Observational Cross-sectional study

Sample size: The total 50 sacral bones were included in our study, after fulfilling inclusion & exclusion criteria. Further bone samples were divided into two sub-groups, which include 25 males and 25 females respectively.

Inclusion criteria

1. Intact sacral bones
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 wise distribution.

	Sacral index		
	Mean	SD	Range
Male (n=25)	97.63	6.23	79.36-121.30
Female (n=25)	110.20	8.69	84.69-132.01
P-value	<0.05		

The mean sacral index of sacrum in males is (97.63± 6.23) and in females (110.20±8.69). Calculated range for males was (79.36-121.30) and female was (84.69-132.01).

Discussion

The present study was conducted on sacrum bones in various medicalcolleges in Rajasthan. It has widely been recognized that skeletal characteristics vary among populations 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.[5]

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 most susceptible to postmortem erosion. In the past many workers have evolved various metrical index for sexing [6]. Mac Laughlin & Bruce in 1986 attempt toimprove 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. [7,8]

Conclusion

We concluded that for sexing of sacrum, the readings obtained by sacral index method were relevant and more significant

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