Section: Anatomy

Original Research Article

A STUDY OF MEASUREMENT OF ACETABULAR ANGLE OF SHARP RADIOLOGICALLY, AMONG HARYANVI POPULATION

Vikram Singh[1], Mahesh Kumar[2]

[1]*Senior Medical Officer GH Kosli, Haryana, India*
[2]*Associate Professor, Department of Anatomy, SHKM GMC Nalhar (Nuh), Haryana, India*

Received : 18/01/2026
Received in revised form : 13/02/2026
Accepted : 16/02/2026

Corresponding Author:
Dr. Mahesh Kumar,
Associate Professor, Department of Anatomy, SHKM GMC Nalhar (Nuh), Haryana, India.
Email: 00drmahesh@gmail.com

DOI: 10.70034/ijmedph.2026.1.339

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (1); 1954-1956

ABSTRACT

Background: The objective of this study is to create standard baseline data on Haryanvi population, To compare present data with previous accessible data if available and To establish the significance of present study for use in forensic sciences & orthopaedic surgery.
Materials and Methods: The present study was conducted on 200 individuals (100 Males and 100 Females) of Haryana region.
Results: The Anterio-posterior view of radiographs of right and left hip joints were taken, after written consent. The Acetabular angle of sharp of both hips were measured. The mean Acetabular angle of sharp in males were 36.62 and 36.09 in right & left hip respectively and in females were 37.36 degree & 37.85 degree respectively, in left & right hip.. However no significant difference in value of acetabular angle of Sharp's in right and left hip in males & females were found. The t-value of right & left side of acetabular angle in males was 1.383 (p- value 0.17 and in females was -1.205 (p -0.231).
Conclusion: Therefore the knowledge of this parameter of acetabulum i.e. Acetabular angle of sharp, would be helpful in performing surgical procedures such as acetabular reconstruction and also helpful for prosthetists.
Keywords: Acetabular angle, Acetabulum, Hip bone.

INTRODUCTION

Awareness of the average values of the bones of the hip joint in males and females will help in early sex determination from skeletal remains by Forensic experts. The acetabulum functions as the socket for the rounded head of femur. The acetabulum and head of femur form the hip joint. The hip joint socket, is a concave hemisphere whose axis is not strictly horizontal but is directed also downwards and slightly backwards along the axis of the femoral neck. The margins of the acetabular notch, curved in outline, and are lined by hyaline cartilage, which continue as a wide band inside the concave surface of the acetabulum. To measure the degree of acetabular development is acetabular angle, which was described by Sharp's in 1961. The normal value of this angle is between 33 and 38 degree. Angle below 32 degree are uncommon and have no clinical significance while angle from 39 to 42 degree are the upper limit of normal range. Angle more than 47 degree are seen in patient with acetabular dysplasia.[1-9]

MATERIALS AND METHODS

The present study was carried out on pelvic radiographs of 200 patients (100 males ;100 females) of Haryana. All age groups of the patient's pelvic x rays, AP view were included in the study and acetabular angle of sharp were measured and comparisons of angles were made between right and left hip and also between males and females. The acetabular angle is the angle formed between a line connecting the pelvic tear drop of right and left side and a second line joining the inferior tip of pelvic tear drop to lateral edge of the acetabular roof.

Exclusion Criteria

Radiographs of patients with osteoarthritis, metabolic diseases, hip fractures were excluded from study.

Statistical Methods

Once the data were collected and tabulated using MS office Excel then the tabulated data was analysed. Quantitative variables are expressed as means + SD and p value <0.05 was taken as significant.

RESULTS

200 radiographs of pelvis of 100 males & 100 females were included in this study. The following observations were made in this study.

[Table 1 & table 2] shows that in male the mean value of Acetabular angle of Sharp of right and left hip were 36.62 and 36.09 with standard deviation ±3.24 and 2.96 respectively. In females the mean value of Acetabular angle of Sharp of right & left hip were 37.36 and 37.85 with standard deviation ±4.33 and 3.28 respectively.

Table 1: Gender distribution

Parameter	Sex	Mean		SD	
		Right	Left	Right	Left
Acetabular angle of Sharp	M	36.62	36.09	±3.24	±2,96
	F	37.36	37.85	±4.33	±3.28

Table 2: Comparison of mean of Acetabular angle of Sharp of present study with the previous studies

SNO	Authors	Year/Journal	Population	Acetabular Angle of Sharp's
1.	Nakamura et al	1989	Japan	38±3.6 (37.3±3.7 in males & 38.6±3.4 in females)
2.	Lavy et al	2003	Malawi (Africa)	36.9±4 in males & 38.6±4.9 in females
3.	Jacobsen et al	2005	Denmark	37.0±3.5 (right) & 37.0±3.5 (left) hips in males and 39.1±3.7 & 38.0±3.8 in females
4	Umer et al	2006	Singapore	39.5±6.0
5	Saika et al	2008	South India	39.2
6	Park JM et al	2011	Korea	38.1±4.2
7	Jermic D et al	2011	Serbian	38.0±3.8 (37.5±3.6 in males & 38.5±3.9 in females
8	Okoseimiema SC et al	2012	South Nigeria	36.39±4.04 in males & 36.99±3.65 in females
9	Present study	2018	Haryana (India)	36.62±3.24 & 36.09±2.96 in left and right hips of males & 37.36±4.33 & 37.85±3.28 in right and left hips of females

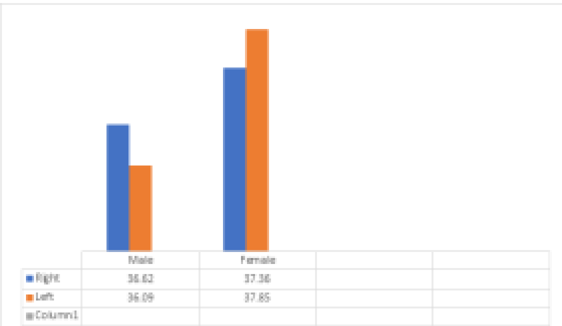

Figure 1: Acetabular angle of Sharp in Males & Females

DISCUSSION

From [Table 2] it was found that the mean value of Acetabular angle in our study was less than the study of acetabulum in Singapore, South India, Malvi females and Denmark populations, and was nearly similar to Japan, Korea and Serbian populations and greater than the study that occurred on South Nigeria and Malvi males.[10-12]

In present study, It was also found that in males, there was no significant difference in value of Acetabular angle of Sharp's in right and left side of hip. The t-value of right & left side Acetabular angle was 1.383 ($p \leq 0.17$) and similarly in females there was also no significant difference in value of Acetabular angle in right & left sides of hips. the t-value of right and left hip Acetabular angle was -1.205 (p- value 0.231). The acetabular angle of Sharp introduced in 1961, is a crucial radiographic measurement for defining adult acetabular dysplasia. Normal sharp angles are generally 33-38 degree with angles between 39-42 is upper limit but more than 47 degree indicating potential dysplasia. Hence knowledge of the anatomical parameters of the bony components of hip joint is very essential as it will open new horizons into better understanding of etiopathogenesis of diseases like primary osteoarthrosis of hip joint.[13-18]

CONCLUSION

It was concluded from above study that in Haryanvi Population the mean Acetabular angle of Sharp's were 36.62±3.24 & 36.09±2.96 in left and right hips respectively, in males and 37.36±4.33 & 37.85±3.28 degree respectively in females. Hence the awareness of the average dimensions of the bones of hip joint in both sexes will also help in early detection of disputed sex by Forensic Experts and prosthetists to construct suitable prostheses.

REFERENCES

1. Harris-Hayes M, Royer NK. The relationship of acetabular dysplasia and femoro-acetabular impingement to hip osteoarthritis: A focused Review. PMR 2011;3(11): 1055-67.

2. Wigberg G. Shelf operation in congenital dysplasia of the acetabulum and in subluxation and dislocation of the hip. J Bone Joint Surg (Am) 1953;35-A:65-80
3. . Arsic S , llic D, Mitkovic M, Tufegdzic M, Jankovic S, Trajanovic M. The study of morphological parameters of human acetabulum significant for hip arthroplasty. http://www.academia. Edu/20201751.
4. Nakamura S, Ninomiya S, Nakamura T. Primary osteoarthritis of the hip joint in Japan. Clin Orthop Relat Res. 1989 Apr;(241): 190-6
5. Croft et al. Osteoarthritis of the hip and acetabular dysplasia. Ann Rheum Dis. 1991; 50:308-10
6. Lau et al. Hip osteoarthritis and dysplasia in Chinese men. Ann Rheum. Dis. 1995;54L:965-69.
7. Smith et al. Osteoarthritis of hip joint and acetabular dysplasia in women. Ann Rheum Dis. 1995; 53:179-81.
8. Goker et al. Radiographic hip osteoarthritis and acetabular dysplasia in Turkish men and women. Rheumatol Int. 2005; 25:419-22.
9. Jacobsen S, Sonne- Holm S. Hip dysplasia: a significant risk factor for the the development of hip osteoarthiritis. Across-sectional survey. Rheumatology 2005; 44:211-18.
10. Umar M, ambyah A, Tan WT, Das De S. Acetabular morphometry for determining hip dysplasia in the Singaporean population. J Orthop Surg(HongKong) 2006;14: 27-31.
11. Saikia et al. Anthropometric study of the hip joint in Northestern region population with computed tomography scan. Indian J Orthop. 2008; 42(3):260-66.
12. Park JM et al. The correlations of the radiological parameters of hip dysplasia and proximal femoral deformity in clinically normal hips of a Korean population. Clin Orthop Surg. 2011; Jun 3(2);121-27.
13. Jeremic D, Macuzic IZ, Vulovic M. Sex differences in anatomical parameters of acetabulum among asymptomatic Serbian population. Vojnosanit Pregl. 2011; 68(11):935-39.
14. Okoseimimiema SC, Udoaka AI. Radiologic determination of acetabula index and centre edge angle in South- South Nigerian population. British J Dairy and Sciences. 2013; 3(3): 22-25.
15. Ralis Z, Mckibbin B. Changes in shapeof the human hip joint during its development and their relation to its stability. J Bone Joint Surg.(Br) 1973; 55-B: 780-5.
16. Wynne-Davies R. Acetabular dysplasia and familial joint laxity: two etiological factors in congenital dislocation of the hip. J Bone Joint Surg (Br) 1970; 52-B: 704-16.
17. Khobragade L, Vatsalaswamy P. Morphometric study of depth of acetabulum. Int J Res Med Sci 2017 Sep; 5(9): 3837-3842.
18. Schdeva K, Singla RK, Kalsey G, Sharma P. Sex differences in Morphometery of North Indian Acetabula—Forensic and Orthopedic Consideration. National J of Clinical Anat. 2019; 8(4): 153-59.