THE CENTRE-EDGE ANGLE OF WIBERG IN ADULT AFRICANS AND CAUCASIANS

A RADIOGRAPHIC COMPARISON

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A radiographic comparison of the CE angle of Wiberg in 324 adult African and 300 adult Caucasian hips has been performed. The distribution curves are similar in the two racial groups.

In an earlier publication (Skirving and Scadden 1979) an anthropometric study of neonatal African hips concluded that the immunity of the African to congenital dislocation was probably related to anatomical factors. The depth of the acetabulum relative to its diameter tended to be deeper in the African than the Caucasian, although the orientation of the acetabulum and the femoral neck was similar in the two groups. It was suggested that a radiographic comparison of the hips of adult African and Caucasians might reveal further evidence of a basic difference in the shape of the hips of the two racial groups.

MATERIAL AND METHOD

Since the osseous limits of a skeletally mature hip can be seen radiographically, the depth of the acetabulum and the degree of cover of the femoral head has traditionally been assessed by measuring the CE angle of Wiberg.

The radiographs of 162 adult Africans were obtained and the CE angle measured, giving 324 readings. The radiographs had been performed mostly for the investigation of trauma, during renal or gastro-intestinal tract contrast studies, or because of obstetrical problems.

Initially the readings were compared to the Caucasian controls in the study by Wynne-Davies (1970), but because the expected differences did not materialise a control series of 150 radiographs were obtained from the Plymouth district radiology department. Although the CE angle can be measured with accuracy it was felt advisable to eliminate the possibility of observer error and all the measurements were made by one observer (APS).

RESULTS

The results are shown in the histogram (Fig. 1). The distribution is similar in the two groups and the expected shift to the right for the hips in Africans does not occur. Nor is there a peak in the range of shallow hips amongst Caucasians to suggest a group with a possible genetically determined acetabular dysplasia.

DISCUSSION

In view of the increased depth of the neonatal African hip compared to the Caucasian, it was expected that the adult African hip would demonstrate a slight but definite shift to the right in any comparative distribution curve. That it does not is disappointing, for it is difficult to reconcile these results with those found previously.

Ráliš and McKibbin (1973) confirmed Le Damany's finding (1912) that during its development the hip is shallowest at the time of birth and becomes progressively deeper. He postulated that this was because of the increased mobility required at birth.
although there is no evidence for this. Indeed at birth there is fixed flexion and quite marked restriction of movement in certain planes and this is imposed by soft tissues, particularly the capsule, and not by the bony configuration of the joint. Subsequently the range of movement increases even though the acetabulum increases in depth and the femoral head becomes more captive.

It is conceivable that the African neonatal hip is skeletally more mature and therefore better contained than the Caucasian at birth, but thereafter development runs parallel to the Caucasian. This would explain the relative immunity of the African to congenital dislocation and also the similar measurements in the present study. Evidence for such skeletal maturity is, at present, lacking although certainly the African child walks at an earlier age than the Caucasian. Also, during the original study the hips of one premature infant not included in the series were shallower than any of the full-term neonates. Confirmation of this hypothesis would require examination and measurement of a series of African foetal hips at different stages of development.

Compared to Caucasians the Africans differ in their susceptibility to hip disease, congenital dislocation being just one condition to which they are relatively immune. Osteoarthritis is another and it is noteworthy that different racial groups tend to be predisposed to both these conditions or to neither. Murray (1965) reported that at least 25 per cent of the cases of osteoarthritis in the hip were related to acetabular dysplasia and one would expect, in view of the rarity of osteoarthritis in the African, that acetabular dysplasia would be less frequent. The finding in this study of a similar distribution of acetabular depths in both racial groups suggests that acetabular dysplasia is only a contributory factor in the aetiology of osteoarthritis.

Clearly, therefore, the fascinating and varying predisposition of different racial groups to develop degenerative disease of the hip can only partly be explained by anthropometric differences.

REFERENCES


