A comparative growth analysis of African child slaves in 15th to 17th century Portugal

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INTRODUCTION

A 2009 salvage excavation in Lagos, Portugal (Figure 1), unearthed human remains from two sites located outside of the medieval city walls. One of these yielded 158 remains buried in an urban waste deposit (Figure 2). Evidence including burial goods, morphoscopic analyses, and genetic analyses, suggests that this was an African slave burial site [1-3].

While the Trans-Atlantic slave trade has been well studied, this is not the case for the slave trade to Europe, which reached Portugal, Spain, Britain, and France. The lives of African enslaved peoples in Europe is poorly understood.

This assemblage includes 23 juvenile individuals. As growth is highly responsive to environmental stressors, understanding the growth of these individuals can shed light on the conditions of life of enslaved Africans in Europe. To this end, we compare the Lagos juveniles to documented juveniles from the US and South Africa whose socioeconomic contexts and growth environment are known.

MATERIALS AND METHODS

All juveniles who had not commenced skeletal fusion and for whom teeth could be measured were selected. This yielded a sample of 20 individuals.

Maximum tooth length was measured either directly or using radiographs (Figure 3) as specified by Livisdige et al [4].

Age was estimated from the length of each available tooth excluding the third molar using formulae provided by Livisdige and colleagues [4,5], which were averaged together to obtain a final age estimate.

Skeletal growth profiles (SGPs) were constructed from diaphyseal lengths of the humerus, radius, femur, and tibia using three comparative samples:
1. Raymond Dart Collection – 29 black children aged 0.16-12.50 years from South Africa; unclaimed bodies collected between 1920 and 1958.
3. South African Long Bone Database – 408 black children aged 0.10-12.70 years from South Africa; mix of cadaveric radiographs and hospital Lodox scans, collected by Dr. Aya Stull between 2007 and 2012.

ANCOVAs were conducted to quantify differences in growth between the samples. This was done separately for children under and over 2 years of age, to account for the differences in growth velocity in infants versus pre-pubertal children.

RESULTS

The SGPs showed that of the comparative samples, the Raymond Dart was the smallest for age, followed by the Hamann-Todd (Figure 4). The SALB sample was the largest for age.

The Lagos sample equated well with the Raymond Dart and Hamann-Todd samples, but was consistently shorter for age than the SALB sample.

The ANCOVA analyses showed slightly different trends between children under and over 2 years of age (Table 1). In children <2 years, the Lagos, Hamann-Todd, and Raymond Dart samples never differed from each other while the SALB sample always did.

In children ≥2 years, the SALB sample remains significantly larger for age than all other samples. The Hamann-Todd sample is now larger than the Raymond Dart sample, sometimes significantly so. In this group, the Lagos sample aligns more closely with the Raymond Dart rather than the Hamann-Todd sample.

DISCUSSION

In younger children, the Lagos sample resembles both the Hamann-Todd and the Raymond Dart samples. In the older children, the Lagos sample more closely resembles the Dart sample. The modern SALB children are significantly larger than other samples at all ages.

The Dart children lived in early 20th century, a difficult time for black South Africans [6]. They were exposed to malnutrition, racial discrimination, and poor living conditions.

The congruence between the Lagos and Dart children suggests that the Lagos children were under considerable stress, however it is unclear whether this is due to the passage from Africa to or to excessive workloads and poor nutrition after arrival. While there is evidence that slaves in the United States were well fed [7], this was not the case here.

Further, the differences in growth between the samples, given that they are all of African ancestry, suggests that environmental, not genetic, factors are the primary driver in growth.

Figure 1. Location of Lagos within Portugal and the Iberian Peninsula. Figure 2. Burial position of individual 6. Individuals were not buried in accordance with contemporary patterns. Figure 3. Measurements of isolated teeth (left), and dental radiographs (center), as a maximum length following the axis of the tooth. Diaphysis of the femur (right). Figure 4. Comparison of the Lagos (green), Dart (yellow), Hamann-Todd (orange), and South African Long Bone (SALB, red) samples. Plots illustrate long bone length for age for the humerus (top-left); radius (bottom left); femur (top right); and tibia (bottom right).