



Exploring the risks accompanying child-bearing in aboriginal society on Gran Canaria (Canary Islands, 13th–15th cal. CE): death of a pregnant woman during her third trimester

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With 5 figures and 1 table

Abstract: In the pre-Hispanic necropolis of Juan Primo, northwest Gran Canaria (Canary Islands, Spain) a grave was found containing a 20–25 year-old woman with a foetus in her abdominal region, whose age at death was estimated at 33–35 weeks of gestation. The purpose of this study is to discuss the possible cause of death of the woman and foetus. Skeletons of both individuals were well preserved, permitting a good record of the bones found in the burial, which is compatible with a pregnancy at preterm. The age of the foetus and the position of the left upper limb raise the possibility that their death was the result of a difficult birth (dystocia). However, a number of alternative disorders can be put forward to explain this death in the third trimester of pregnancy, such as eclampsia and abruption placentae. In this case, pertinent ethnohistorical and osteoarchaeological information about the ancient canaries allows us to assess some of the stressors that would increase their maternal mortality. The lack of similar evidence in archaeological contexts makes this an important finding, providing a likely case of obstetric problems and their impact on pre-industrial societies.

Keywords: ancient canaries; pregnancy; death during childbirth; gender archaeology, Canary Islands

Introduction

Historical sources emphasise the high mortality associated with childbirth in past societies (Högberg et al. 1987; Arriaza et al. 1988; Šlaus 2000), although death during childbirth has rarely been documented by archaeology. These deaths have generally been attributed to the poor hygiene and health problems seen as characteristic of pre-industrial societies, and not to the danger inherent in this biological event (Malgosa et al. 2004). Indeed, in the immense majority of cultures childbirth has not been associated with risk or death (Martin 2001; Stone 2009). On the contrary, childbirth is considered an important event full of meaning, in which women obviously have the central role.

The most visible evidence of reproductive mortality is provided by double burials where a woman appears with a foetus/perinatal child in her abdominal region. However, this archaeological evidence is scarce compared to the number of expected deaths due to such problems (i.e., Hawkes & Wells 1975; Wells 1978; Owsley & Bradtmiller 1983;

Pounder et al. 1983; Persson & Persson 1984; Högberg et al. 1987; Agustí & Codina 1992; Campillo et al. 1998; Malgosa et al. 2004; White & Folkens 2005; de Miguel-Ibáñez 2008; Flores & Sánchez 2007; Rascón-Perez et al. 2007; Cruz & Codinha 2010; Willis & Oxenham 2013; Lieverse et al. 2015; Malgosa et al. 2016; Piga et al. 2016). This scarcity may be due to other factors such as specific funerary practices associated with this population (Rascón-Perez et al. 2007; Cruz & Codinha 2010). The death of the mother and foetus at the same time during pregnancy and childbirth does not necessarily imply that both were buried together (Arriaza et al. 1988). Furthermore, taphonomic processes that affect the conservation of skeletal remains may also be involved, since the skeletal preservation in subadults is typically poorer than in adults (Guy et al. 1997; Bello & Andrews 2006). Another possible reason for the rarity of pregnant women in the archaeological record may be due to *postmortem* expulsion of the foetus (Schulz et al. 2005; Lasso et al. 2009).

Interpretation of burials of pregnant women is a challenge, since disorders that currently cause high mortality

during pregnancy, such as eclampsia and placental abruption, are impossible to diagnose from the osteoarchaeological record. Moreover, deaths during pregnancy represent only a small fraction of mortality associated with reproduction; as observed at present, most deaths are the result of acute infections and postpartum haemorrhages (AbouZahr 2003; WHO 2012; MacDonald 2013). Neither can the influence of other cultural and social factors on reproductive mortality be ignored, since an estimated 20% of today's cases can be attributed to poverty, isolation, gender discrimination, dangerous cultural practices and beliefs, overwork, domestic violence, poor nutrition, infectious diseases, etc. (MacDonald 2013). Hence, the phenomenon of death during pregnancy should be approached from a historical and social perspective (Stone 2016), not only palaeopathological.

In this contribution, the burial of a mother with a foetus at preterm in her abdominal region is presented. Both could have died due to complications during the last term of pregnancy. Here we explore several possibilities that may have led to maternal and foetal death, for both palaeopathological and historical reasons.

Material and methods

Material

The human remains are from Juan Primo cemetery, an archaeological site from the pre-Hispanic period in Gran Canaria (Fig. 1). The ancient inhabitants of Gran Canaria came from North Africa, probably settling on the island

sometime during the first centuries of the present era (Arco-Aguilar et al. 2017; Atoche-Peña & Ramírez-Rodríguez 2011; Morales et al. 2017), as genetic and linguistic evidence along with material culture suggest (Maca-Meyer et al. 2004; Tejera-Gaspar et al. 2006; Rodríguez-Varela et al. 2017). Archaeological studies, along with ethnohistorical sources arising from contact with Europeans, portray the ancient canaries as a stratified society (Velasco-Vázquez 1999; Onrubia-Pintado 2003; Santana-Cabrera et al. 2015). These people inhabited the island with minimal contact with other territories for hundreds of years until the arrival of Europeans in the mid-fourteenth century (Velasco-Vázquez 2015).

Their subsistence practices were based on surplus agriculture, e.g. barley and wheat (Morales-Mateos 2010). Goats, sheep, and pigs played a major role in the economy and were also significant in the symbolic sphere. Studies of fauna at sites along the coastline of Gran Canaria also indicate that fishing and shellfish gathering were fundamental to subsistence (Velasco-Vázquez et al. 2000). Their isolation and dependence on farming resources made fertility and its associated symbolism very important to them, mainly because of the impact that periods of shortage could have (Onrubia-Pintado 2003; Velasco-Vázquez 2009). The island was finally conquered and annexed by the Castilian Kingdom in the late fifteenth century (Onrubia-Pintado 2003).

Juan Primo cemetery is made up of 16 burials, mostly single and primary, with a minimum number of 18 individuals (Santana-Cabrera 2010). In addition, the remains of at

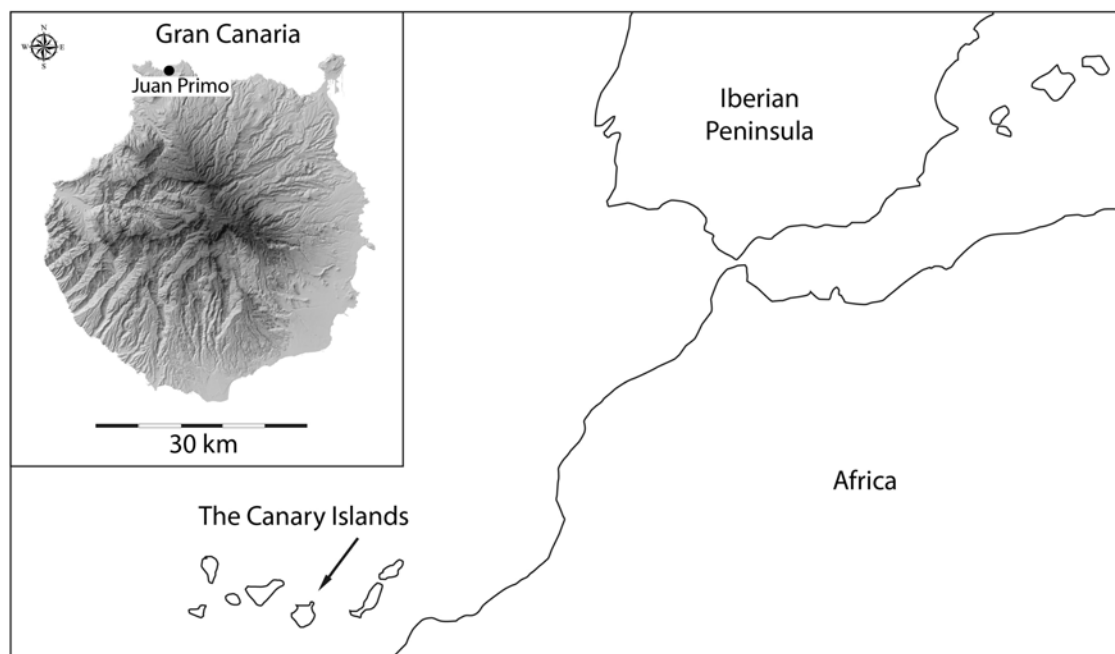


Fig. 1. Map of Gran Canaria Island and Juan Primo cemetery.

least five individuals are also documented in the arable plots generated by recent ploughing of the land where the cemetery is situated, corresponding to other graves that were destroyed. The undisturbed bodies were laid in extended face-up position with their heads oriented N-NW in most cases and raised relative to the body. The arrangement of the skeletal remains inside the graves suggests that decomposition took place in a space where silting up was delayed by the presence of a shroud and now missing fastenings (Alberto-Barroso & Velasco-Vázquez 2009; Santana-Cabrera 2010; Alberto-Barroso et al. 2014).

The bone remains of the pregnant woman, Burial 4, were dated by radiocarbon methods to 1270–1400 cal CE 2σ (Beta-248146, 660 ± 40 BP), whereas the entire burial ground, according to further radiocarbon dates, was used between the 12th and 15th centuries CE (Santana-Cabrera 2010). Radiocarbon dates also indicate that the burials were placed from west to east for approximately 300 years. A diachronic sequence of burials 14, 16 and 12 was also observed from their stratigraphic relationships, ratified by radiocarbon dating.

Method

The adult's age at death was estimated according to the morphological appearance of the pelvic girdle. The method of Schmitt (2005) was used on the auricular surface and that of Brooks & Suchey (1990) on the pubic symphysis. Sex was distinguished according to the morphological characteristics of the skull and pelvis (Buikstra & Ubelaker 1994; Bruzek 2002; White & Folkens 2005). Maximum length of long bones was used to estimate the age of death of the foetus using methods based on dry bone measurements (Fazekas & Kósa 1978) and regression equations of foetal age based on foetuses of known gestational age (Scheuer et al. 1980; Sherwood et al. 2000). Only two bones were preserved well enough to perform this estimation: the right humerus and right ulna.

Results

The adult individual was a woman who was pregnant at the time of death with a foetus located in her abdominal region (Fig. 2). The body was in extended face-upwards (supine) position with the head raised and supported on the wall of the grave. The skeleton was well preserved although the skull was partially fractured by recent agricultural activity. The age at death was estimated at 20–25 years from diagnostic indicators examined in both hip bones. Sternal ends of the clavicle were not fused but other long bone epiphyses had already undergone fusion. The third molars had erupted and there was little tooth wear. Unfortunately, there are no palaeodemographic studies focused on the pre-Hispanic population of Gran Canaria to advance discussion on the age at death, although the available evidence indi-

cates a higher rate of female mortality at between 20 and 35 years old (Delgado-Darias 2009; Velasco-Vázquez 2009; Santana-Cabrera et al. 2015). The pathologies detected were auricular exostosis in the left ear canal, dental enamel hypoplasia and slight alterations due to osteoarthritis in the lumbar vertebrae. No hip bone abnormalities were observed. Unfortunately, the pubic bones had deteriorated, so alterations produced by previous pregnancies were not detected.

The body decomposed in a filled space with a shroud that prevented the rapid entry of sediment during the decomposition of the body. Certain joint connections maintained their primary position and the shifts observed had all taken place within the corpse volume. There was verticalisation and translation of the clavicles through compression of the shoulder girdle with flattening of the ribs. The temporomandibular joint was dislocated, and the mandible rested directly on C7 and the right first rib. Both humeri were medially rotated about their own axes. The upper limbs were placed symmetrically at the sides of the body with both hands on the pelvic girdle. Some joints in the hands were displaced



Fig. 2. Burial of the pregnant woman.

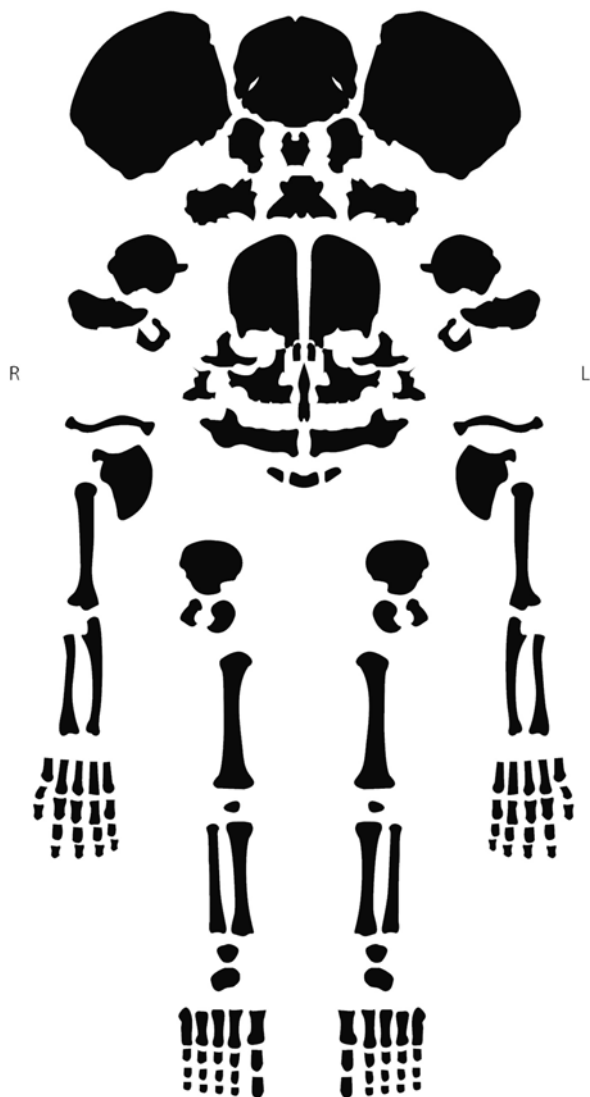


Fig. 3. Skeletal representation of the foetus.

by *postmortem* opening of the pelvis, permitted by the space resulting from the decomposition of soft tissues. The pressure exerted by the volume of the foetus may have favoured this movement. The legs were arranged symmetrically with the kneecaps in anterior position. A slight shift in the tibio-talar joint was noted, although tarsals, metatarsals and phalanges remained in the original position. This corpse arrangement is widely observed in pre-Hispanic burials in Gran Canaria and results from burial with a shroud using ties to the elbows, wrists, knees and feet (Alberto-Barroso & Velasco-Vázquez 2009; Alberto-Barroso et al. 2014). This prevented too rapid an entry of sediment into the spaces left by soft-tissue decomposition and influenced the *postmortem* bone movements.

The foetus was well preserved (Fig. 3) and lay on the right of the mother's abdominal area with a cephalic presentation

(Fig. 4). It was face down in an oblique position with respect to the axis of the mother's body. The skull was within the lower abdomen of the mother, the face oriented downward and resting on the pubic region of the pelvic girdle, which was open due to the decomposition of the corpse. The skull appeared dislocated and it was not possible to reconstruct, but there is no evidence to suggest a cephalopelvic disproportion. The legs were bent under its body. The right upper limb was also flexed, with the hand partially supinated. The left upper limb was raised above the shoulder with the elbow semi-flexed and resting on the adult sacrum with the hand under its face. The foetus's original position was confirmed by the consistent anatomical relationship of the bones. The joints did not exhibit a strict union, due to the immature skeletal system at this stage of growth (Scheuer & Black 2000; Duday 2009; Schaefer et al. 2009). However, the position of these bones and their interrelations suggest the body was in primary position and the decay process took place in this situation. Other bones within the thoracic cavity had, however, shifted from their original position, explicable by the face-down body placement and the action of gravity while the soft tissues were decomposing (Pinheiro 2006; Duday 2009). The most plausible gestational age at death was assigned as 33–35 weeks according to several methods (Table 1).

Discussion

The burial constitutes a single deposit with the human remains of a mother and her unborn child. The arrangement of the foetus in the abdominal region with a cephalic presentation and 33–35 weeks of gestation is evidence for burial with the foetus inside the uterus. This configuration usually occurs at about 32 weeks of gestation due to changes within the uterus and in foetal size (Cunningham & Williams 2001). The woman may have died due to a complication in the final phase of pregnancy or during labour. Among the syndromes that can cause death in the third trimester of pregnancy are dystocia, contracted pelvis, eclampsia, placental senescence, placental abruption, and acute infections (Alduc-Le Bagousse & Blondiaux 2002; WHO 2012; MacDonald 2013).

Dystocia may be due to many factors that alter the normal process of labour, such as large foetus size, abnormal presentation (deflected cephalic, breech, shoulder, etc.), anomalies in the birth canal, etc. (Seeds & Cefalo 1982; Neilson et al. 2003). Determining the type of dystocia in an archaeological context is extremely difficult because many of these complications do not leave evidence in skeletal remains (Cruz & Codinha 2010; Malgosa et al. 2016). When dystocia occurs, the mother soon suffers hyperthermia due to infection of the uterine cavity contents. Hyperthermia causes maternal and foetal tachycardia, which adds to her exhaustion. So the death of the mother and consequently the foetus is caused by sepsis, haemorrhage and exhaustion (Neilson et al. 2003; Malgosa et al. 2004).



Fig. 4. Foetus in the abdominal area of the mother.

Table 1. Gestational age estimation of the foetus (in weeks).

| Bone | Maximum length | Fazekas & Kósa 1978 | Scheuer et al. 1980 | Sherwood et al. 2000 |
|---------------|----------------|---------------------|---------------------|----------------------|
| Right humerus | 58 mm | 36 | 35.2 ± 2.33 | 35.5 ± 2.12 |
| Right ulna | 48 mm | 32–34 | 34.2 ± 2.33 | 32.0 ± 2.33 |

In this case, the body of the foetus is placed in a right occiput anterior position which does not imply any anomaly in presentation (Fig. 5). An anomalous position of the head may also produce dystocia, but it is unfeasible to determine the exact position of the foetal head because the skull did not maintain its volume. The brain is one of the organs that decompose fastest, facilitating collapse of the cranial vault, already weak in foeti (Vass 2001; Pinheiro 2006; Lewis 2007). The cranial bones had fallen inwards and moved slightly, losing their primary position. While the approximate position of the bones was visible, it was not enough to determine whether the foetus had an unusual cephalic presentation (Acker et al. 1985). The position of the head makes a shoulder dystocia unlikely since it can be only identified when the head goes through the birth canal (Malgosa et al. 2004). The raised position of the left upper limb may represent an anomalous position which prevented delivery. If the left shoulder impacted behind the maternal pubis while passing through the narrow passage, owing to a

fault in rotation, it could have impeded progress beyond the pubic symphysis.

Other reasons must be considered since there is no conclusive evidence of dystocia. Based on data for modern-day populations (WHO 2012; MacDonald 2013), eclampsia is another frequent condition that probably had a wide incidence in archaeological populations. It is a potentially dangerous and common pregnancy disorder originating in the placenta, which causes significant maternal and foetal problems. In the worst cases, it may result in the death of both mother and baby. There is general agreement that this disorder is caused by an endothelial vascular disturbance. Among explanations of its pathogenesis, it is postulated that the maternal immune response causes an abnormal invasion of trophoblastic tissue into the uterine wall to counter the allogenic stimulation of the foetus and the weaker perfusion of placental oxygen due to arterial vasospasm (Lyll et al. 2013). These placental and endothelial vascular disturbances damage all the organ structures of pregnant women,

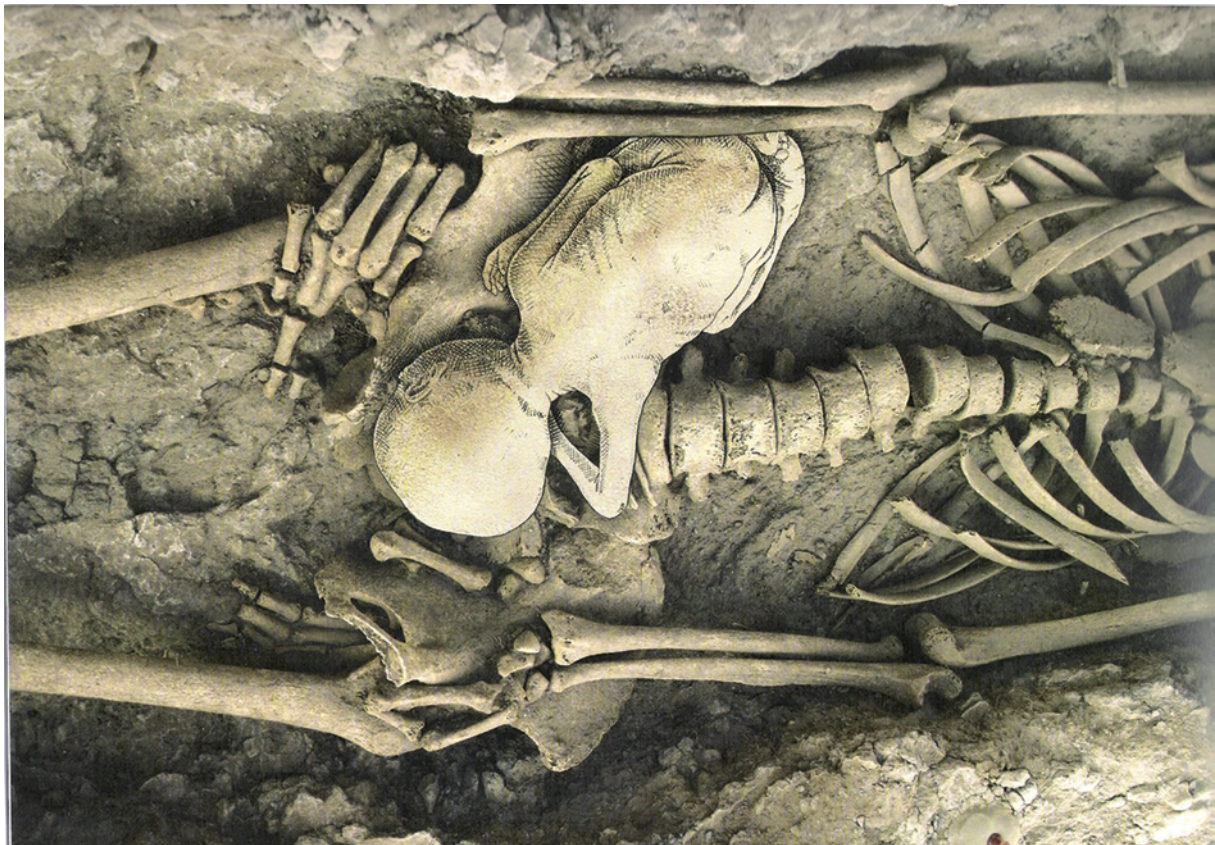


Fig. 5. Reconstruction of the position of the foetus in the mother's abdominal area (Author: Agustín Cassasa).

such as the central nervous system, alveoli, myocardium, hepatocytes, renal glomeruli, vascular endothelium and the immune system (Duckitt & Harrington 2005). Risk factors for eclampsia include a history of preeclampsia, primiparity, obesity, family history of preeclampsia, multiple pregnancies, and chronic medical conditions such as long-term hypertension or diabetes (Duckitt & Harrington 2005).

Such a set of conditions does not produce signs in the skeletal remains, so it was not possible to determine if the pregnant woman from the Juan Primo site died of this disorder. However, eclampsia mainly occurs from the twentieth week of pregnancy onwards, and 90% of cases occur during the thirty-fourth week (the last month), just at this woman's stage of pregnancy. Currently, eclampsia results in 10% to 15% of maternal mortality worldwide (WHO 2012). It affects between 5% and 8% of all pregnancies in developed countries, and 10% in those considered as developing. It occurs in between 6% and 17% of nulliparous women compared to between 2% and 4% in multiparous (Bryant et al. 2005). Hence, while its verification in archaeological contexts is somewhat difficult, its high incidence in the current population supports considering it a possible cause of maternal and foetal death in the past. This takes into account that the aboriginal Canary islanders lacked the medical knowledge

and techniques necessary to respond appropriately to this disorder.

Various other syndromes also cause mortality in pregnant women in the third trimester. Syndromes such as asyclitism (oblique malpresentation), other anomalies in presentation of the foetus, unobserved pelvic abnormalities in the mother, soft-tissue dystocia, pathologies in the vagina or the placenta, etc., are all possible (Campillo et al. 1998; Cruz & Codinha 2010; Lieverse et al. 2015). Given the nature of this archaeological find, it is very difficult or impossible to determine which of these were the origin of the problem.

Assessing the evidence from this case for Gran Canaria aboriginal culture, how do we interpret the death of this woman and foetus in its social context? The general living conditions applicable to pregnant women should be considered and within a broader frame of reference the female population in general. Although we do not have conclusive evidence to establish an accurate diagnosis for the cause of death of this woman, other osteological evidence regarding this island population allows us to contextualize it within the risks suffered by aboriginal women in their daily lives. Osteoarchaeological evidence indicates that there was a higher female mortality than that of men between 20 and 35 years of age (Delgado-Darías 2009; Velasco-Vázquez

2009; Santana-Cabrera et al. 2011–2012; Santana-Cabrera et al. 2015). This period coincides fully with the fertile stage of women, and its incidence is very likely due to the dangers of childbirth, postpartum and continual pregnancies. Demographic data from other populations also indicate higher percentages of female mortality during their reproductive years (Blakely 1977; Lovejoy et al. 1977; Owsley & Bradtmiller 1983; Högberg et al. 1987; Arriaza et al. 1988; Martin et al. 1991). However, these data alone are not enough to elucidate the phenomenon under study, since other factors that explain this mortality pattern are not considered. Indeed, as mentioned at the beginning of the text, there are few examples that permit hypotheses to be suggested or refuted regarding the exact cause(s) of the fatal complications (Stone 2016). It is likely that, in addition to the above candidate factors, others may also intervene in this fatality, such as nutritional status, patterns of physical activity, illnesses, and interpersonal violence (Larsen 1997; Goodman & Martin 2002; Steckel et al. 2002; Gowland & Knüsel 2006; Crown & Nichols 2008; Stone 2016).

In the case of Gran Canaria, several osteoarchaeological studies point to an asymmetric (unequal) access to certain food products according to gender, apparently resulting in a lower quality diet for women. The archaeological evidence indicates that the subsistence of the inhabitants was based mainly on a surplus agricultural economy, although with a variable but notable proportion of marine resources and meat and dairy products from their livestock (Velasco-Vázquez 1999; Delgado-Darias 2009; Arnay-de-la-Rosa et al. 2010). This would have assured *a priori* the perpetuation of their way of life until the Castilian conquest and colonization of the island disturbed it. The consumption of plant-derived foods is clearly quantified in dietary markers such as dental caries, with 17.3% of their teeth affected among the aboriginal population as a whole (Delgado-Darias 2009). Within this framework, the percentages of caries and calculus and trace element concentrations in the bone tissue indicate that the diet of women included a higher percentage of carbohydrate intake from agricultural crops, compared to a lower percentage of animal proteins (Velasco-Vázquez 1999; Delgado-Darias et al. 2005; Delgado-Darias et al. 2006).

On the other hand, the evidence for male nutrition features a greater proportion of animal protein, as deduced from a lower percentage of teeth with caries (14.7% in men and 20.3% in women) (Delgado-Darias et al. 2005), and a higher proportion of tooth-sockets showing signs of periodontal disease (23.4% in men and 16.7% in women) associated with calculus deposits (66.98% in men and 57.6% in women) (Delgado-Darias et al. 2006; Delgado-Darias 2009). These data are reinforced by the incidence of non-senile osteoporosis, which affected almost 20% of the aboriginal population of Gran Canaria. The incidence of this latter pathology has been interpreted as a reflection of a hypo-proteic diet based mainly on the intake of cereal and vegetable products, with a significantly higher level in

women, perhaps due to lower meat consumption (Velasco-Vázquez et al. 1999). In short, these dietary differences are possible indices of worse conditions of life for aboriginal women, which surely must have influenced their health.

In the ethnohistorical texts from the period of contact between the ancient canaries and Europeans (15th–17th centuries), several aspects of everyday life are mentioned that may be linked to ensuring reproductive success. It is likely they were intended to avoid complications during pregnancy, to the extent their medical knowledge permitted, and avoid such mortality of women and unborn children. These texts describe how the pre-Hispanic women of Gran Canaria were fattened before marriage to become or appear more fertile. The girls were kept as recluses for a month during which they drank plenty of milk with *gofio* (flour ground from toasted grain) and other nutritious and fattening foods: “Long before they sleep with them, they fatten them up with milk so much that their skin gets overloaded like figs, because they do not rate the skinny ones as good as the fat ones, since they say their belly stretches to make bigger children” (“*Más antes que con ellos duerman, las engordan tanto con leche, que su piel se carga como hacen los higos; porque no tienen a la flaca por tan buena como a la gorda, pues dicen que se le alarga el vientre para hacer hijos grandes*”) (Zurara [1452–1453] 1998: 332–353); “and there were houses or caves where they assisted with the chores, and they were fat and over-indulged. They knew how to sew and toast grain, and left there to marry when asked, and with only their own consent were they thus married. Guests were invited and the wedding was celebrated” (“*i había casas o cuebas onde acistian, i estaban gordas i regalalas. Savían coser i tostar i salían para casarlas quando las pedían, i sólo con la voluntad eran ya casadas, i hacen un convite i vailes se celebraba el desposorio*”) (Gómez Scudero [17th century] in Morales-Padrón 2008: 433–434).

Premarital fattening would help to accelerate menarche in younger women and ensure fertility in the older ones, achieving the fat percentage in the body to stabilize their menstrual cycle. Once pregnant, the body mass reserves established would guarantee good progress in pregnancy and lactation, strengthening the immune system (Velasco-Vázquez 2009). This type of practices would be aimed primarily at controlling and ensuring reproduction, the fertility of society itself, and are also an expression of male domination over women as their child-bearers. Indeed, we cannot ignore the importance of controlling female sexuality as a strategy to ensure male domination in a patriarchal society such as Gran Canaria (Rodríguez-Rodríguez 2000; Velasco-Vázquez 2009; Santana-Cabrera 2018).

Another issue to be taken into account is that these ethnohistorical descriptions refer to the period prior to the arrival of Europeans, so it is unknown whether this was always the practice or, instead, only took place at a certain time. To this end, it should be noted that the archaeological evidence indicates an increase in agricultural productivity

since the 10th century, which is observed, especially in the appearance of large fortified collective granaries to conserve food, and an increase in the number of villages throughout the island (Morales et al. 2014). Historical and ethnographic studies highlight that technological advances and increased land productivity are elements that favour a higher population density (Ashraf & Galor 2011). This is because communities thus become less sensitive to external conditions and are able to improve the availability of resources (Wood 1998; Shennan 2018). This development towards surplus agriculture would itself have favoured fertility and reproductive success along with the above practices such as fattening.

The success of these customs has been traced by looking for episodic stress markers present in the aboriginal skeletons, such as hypoplasia of dental enamel or Harris lines in the long bones, whose low incidence in this population reveals few problems of malnutrition during childhood (Velasco-Vázquez 1999; Delgado-Darias 2009; Velasco-Vázquez 2009). In any case, the main imbalances may be due to changes in diet due to weaning. Therefore, the customary prior fattening of these women apparently fulfilled the purpose of avoiding nutritional deficiencies in children during pregnancy and growth, and eventually during periods of scarcity (Velasco-Vázquez 2009). The possible physical and psychological repercussions among these women of this premarital process are another matter.

Such influences together with other factors are linked to the sexual division of labour (Santana-Cabrera et al. 2015) and to the ostentation of fixed or inherited power structures among the Canary aboriginals. Men habitually assumed leadership roles assigning women a secondary status, revealing a regime of formally institutionalized inequality (Rodríguez-Rodríguez 2000; Rodríguez-Rodríguez 2006; Santana-Cabrera 2018).

One aspect to highlight is the presence of exostosis in the left external auditory canal of the pregnant woman. In a study conducted with 323 skulls (179 male, 129 female and 15 of undetermined sex) (Velasco-Vázquez et al. 2000), 40.21% of the individuals from the coast showed this anomaly (39 of 97), while that only 0.88% of the natives of the interior presented this disease (2 of 226). This marker consists of a bone anomaly that occurs in the auditory canal as a response to daily contact with the cold water of the sea, and is considered a marker of water-related activities that today frequently affects surfers, divers and shellfishers (Velasco-Vázquez et al. 2000; Villotte & Knüsel 2016). In coastal skulls affected by auditory exostosis, there were no significant variations according to the sex of the skeletons ($n = 27/179$, 15.08% in men; $n = 14/129$, 10.85% in women), which suggests that there were no gender differences in the performance of activities related to the marine environment (Velasco-Vázquez et al. 2000). Therefore, the exostosis of the auditory canal was probably a consequence of the participation of pregnant women in activities related

to the marine environment. Given that it is an anomaly that appears as a response to a prolonged stimulus over time, it cannot be determined with certainty whether this woman continued to carry out such activities throughout her pregnancy. To this end, the ethnohistorical sources comment that pregnant women also participated in the fishing and that, in addition, “if the woman was pregnant the child in her womb was given its share just like its mother, and thus both were paired together” (“*si estaba la muger preñada le daban su parte á la criatura que staba en el vientre como á la madre, y así los emparejaban ambos*”) (Abreu Galindo [1632] 1977: 101). So it is likely that the Juan Primo woman continued participating during her pregnancy in the marine activities that had triggered the exostosis.

On another level, the act of bearing new life was clearly considered an important event charged with meaning for which women were responsible (Gaskin 2002; Stone 2016). Apart from the biological strategies aimed at guaranteeing the success of reproductive needs, there are many symbolic manifestations in Canarian archaeology that link woman-fecundity-reproduction, including those related to the fertility of land and animals in a broad sense. This is evident from the ceremonial centres scattered across the island's summit, where pubic triangles are often found engraved on the walls of the caves (López-Peña et al. 2009), or examples of anthropomorphic figures, locally known as *ídolos*, with exaggerated female genitals or represented as pregnant (Onrubia-Pintado et al. 2000).

In summary, the archaeological evidence is insufficient to propose a cause of death for the mother and foetus, although we can suggest dystocia, preeclampsia, or other complications during the last trimester of the pregnancy. The osteoarchaeological and ethnohistorical evidence suggests that women had a lower social status compared to men which is for example manifested in unequal access to food for most of their non-nubile/pregnant lives. This did not prevent the women's reproductive capacities from being venerated, with a greater food allowance during the pre-marriage and pregnancy period. This strategy would have proved effective in ensuring the biological reproduction of the group. Indeed, the fertility of women as a preeminent aspect of the ritual customs of the ancient canaries is evident in their symbolic representations, suggesting that they developed all kinds of social strategies to guarantee their reproductive success.

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