Journal of Archaeological Science: Reports 9 (2016) 405–415

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Skeletal evidence of craft production from the Ch'iji Jawira site in Tiwanaku, Bolivia

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ARTICLE INFO

Article history:
Received 1 May 2016
Received in revised form 18 August 2016
Accepted 18 August 2016
Available online xxxx

Keywords:
Bioarchaeology
Labor
Movement
Activity patterns
Musculoskeletal stress markers
Entheses
Osteoarthritis
Ceramics manufacture
Pottery
Weaving
Complex society formation

ABSTRACT

The Tiwanaku culture in the Bolivian highlands was comprised of neighborhoods home to various groups laboring at differing jobs. Ch'iji Jawira, one site within this community, is described archaeologically as containing both a manufacturing center for pottery and a residential area home to these ceramic manufacturers. Prior bioarchaeological research has also noted that the people buried at the Ch'iji Jawira site show statistically significant differences in labor and activity from others who lived in the Tiwanaku capital. Using a life-history approach, this study explores the idea that Ch'iji Jawira was home to ceramic specialists by describing one individual from this community, a 30–39 year old female (CJ-35250). This person has evidence of degeneration associated with osteoarthritis in her arms, wrists, hands, fingers, lumbar spine, sacroiliac, hip, and feet. The bones of her wrists, hands, fingers, and feet also have extensive skeletal changes at tendon and muscle attachment areas. The pattern on her bones suggests she worked at crafting, especially tasks involving repetitive joint movement and heavy use of arm, hand, and foot musculature. From her burial location and grave goods, it may be that CJ-35250 was one of the earliest potters at this site.

1. Introduction

The Tiwanaku culture (500–1100 CE) was one of the earliest state-level societies in the South Central Andes (Janusek, 2008; Kolata, 1993; Stanish, 2013) (Fig. 1). With its heartland in the Lake Titicaca basin *altiplano* (i.e. high-elevation Andean plateau), the main city of Tiwanaku was a dense, multi-ethnic urban center with various *barrios* (i.e. neighborhoods) home to specialists laboring at differing jobs (Albarracín-Jordán, 1996; Becker, 2013; Janusek, 2004; Janusek, 2008) (Fig. 2). Since repeated activities are inscribed onto human physical bodies (Bourdieu, 1977; Budden and Sofaer, 2009; Liimakka, 2011; Merleau-Ponty, 2013 [1945]), the observation of skeletal changes can provide insight into individuals' daily routines (Buikstra and Beck, 2006; Buikstra and Pearson, 2006; Larsen, 1997; Larsen, 2015; Sofaer, 2006). Thus, the tasks people frequently worked at throughout their lifetimes are understood as patterns of movement on their bones that address how they lived. They also provide a contextual representation, especially in cases like Tiwanaku, where we have no written record of life in a prehistoric culture.

My prior, population-centered Tiwanaku research on activity and labor has shown that people from this culture vary spatially and temporally in labor levels and workload across the state, including within the many neighborhoods of the Tiwanaku city (Becker, 2012; Becker, 2013; Becker, 2017). The *barrio* of Ch'iji Jawira (number 12 in Fig. 2) was one such area with significantly different skeletal indicators of activity (e.g. musculoskeletal stress markers and osteoarthritis). Descriptions of this site note it containing both a manufacturing center for pottery and a residential area home to these ceramic manufacturers (Janusek, 2004; Rivera, 1994; Rivera, 2003). Archaeologists uncovered ceramic firing zones, pottery production refuse, as well as evidence of floor surfaces used in the preparation and shaping of ceramics at Ch'iji Jawira (Rivera, 2003: 306). The proximity to a clay source/procurement area and an almost year-round water supply would have been beneficial reasons for settlement of this location. Residence at this site likely began during the Late Formative (300–500 CE), with it emerging as a major ceramic production area and household compound during Tiwanaku times.

In this study, I use a contextual, life-history approach to explore the lived experience of residents' connection to ceramics manufacturing by analyzing the most complete adult individual burial (i.e. CJ-35250) from this community. As noted by Rivera (2003: 297), Ch'iji Jawira provides the only significant, in situ evidence of specialized ceramic production within the city of Tiwanaku. In addition, craft specialization has a long history in the Andes of being associated with emerging civilizations, power, and identity formation (Costin, 2004; Janusek, 1999; Silverblatt, 1987; Vaughn, 2006). Thus, studying this burial provides an opportunity to observe skeletal evidence of production from a

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http://dx.doi.org/10.1016/j.jasrep.2016.08.017
2352-409X/

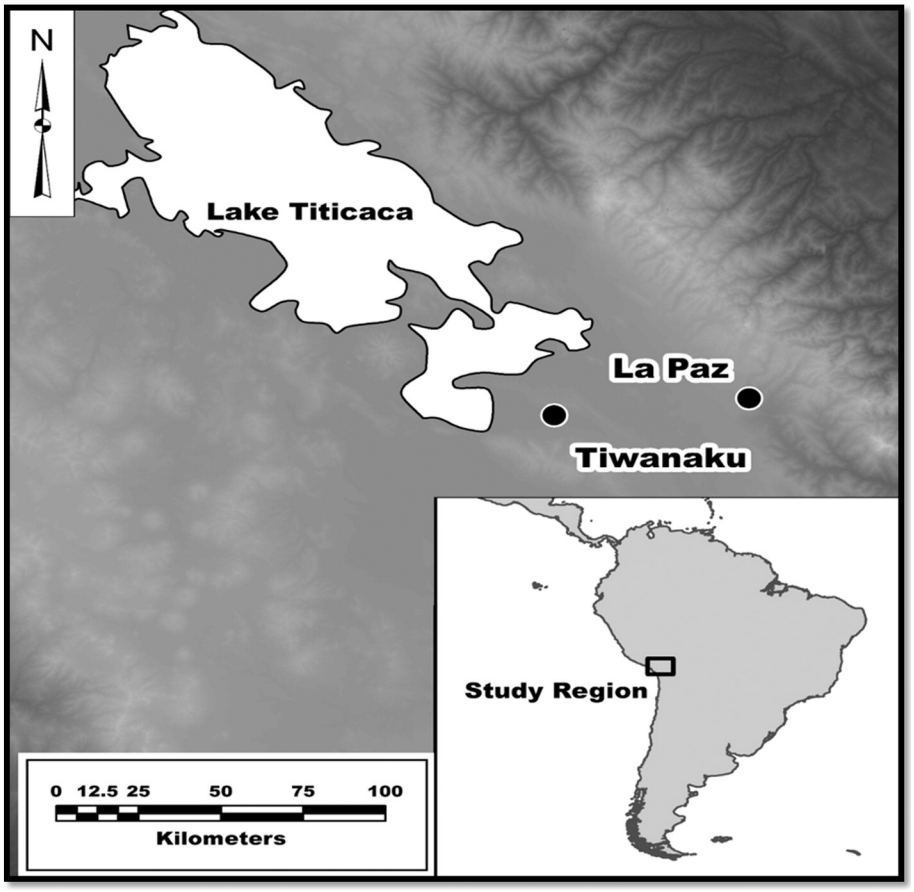

Fig. 1. Map of the study area.

known crafting site and potentially isolate a pattern of activity on skeletal remains that may be associated with ceramic manufacturing as an occupation. This research also adds a bioarchaeological perspective to the literature on Andean craft production and another possible way of assessing the importance of specialized goods producers.

2. Materials and methods

The site of Ch'iji Jawira sits on the broad, flat plain of the Andean plateau approximately 1000 m from the monumental Akapana pyramid. Excavation of Ch'iji Jawira was undertaken by the Proyecto Wila Jawira from 1990 to 1991 and proved to an area of pottery production, as noted by the evidence of a ceramic molds, broken sherds, a clay procurement source, and near to some *qochas* (i.e. rain-fed ponds). Among the many artifacts recovered, eight burials from this site are housed in the present-day town of Tiahuanaco, Bolivia under the auspices of the Centro de Investigaciones Arqueológicas, Antropológicas, y Administración de Tiwanaku (CIAAAT). For these individuals, I estimated age-at-death and sex using standard methods (Bass, 1981; Buikstra and Ubelaker, 1994; Suchey and Katz, 1998; Ubelaker, 1999). First, I evaluated dental eruption, dental wear, and epiphyseal closure. I also recorded changes in sternal rib ends, the pubic symphysis, auricular surfaces of the os coxae, as well as endocranial and ectocranial suture closure. For sex, I recorded data from various points on the os coxae, and if not present, then sex was estimated using cranial elements. Six adults (one possible male age 13–17, one possible male age 20–39, two females in their thirties, and two individuals for which sex could not be identified) and two neonatal-age subadults were noted as present.

Overall, the majority of these burials are less than 50% complete. Only burial CJ-35250, a 30–39 year-old female, had over 90% of the skeleton present with only a nasal bone and portions of the ribs missing. Hence, this individual became the focus for this life-history study. Excavation records of CJ-35250 show that the skeleton was from a flexed, individual burial context, with grave goods including an uncommon gold miniature mask in the stylized form of a human face and a camelid skull offering, along with a somewhat more common undecorated *vasija* (i.e. urn). While there are no radiocarbon dates, it is possible this burial represents some of the earliest evidence of occupation at Ch'iji Jawira as the *vasija* style, paste, and finish are akin to the Late Formative 2/Qeya style (300–500 CE) (Rivera, 2003). Of the other individuals present, the younger male age 13–17 (CJ-36995-1) had the second largest number of skeletal elements present with a left clavicle, humerus, os coxa, femur, and patella, a left and right ulnae, the proximal end of a right second metacarpal, four of the five metatarsals, three of seven metacarpals, and three lumbar vertebrae. CJ-36995-2, the other 30–39 year old female, was second most complete and comprised a left os coxa, a left humerus, a right ulna, and a left femur and tibia.

In order to understand the skeletal evidence of labor at Ch'iji Jawira, a macroscopic investigation of CJ-35250, along with data from CJ-36995-1 and CJ-36995-2 wherever possible, was undertaken and information collected on two potential indicators of skeletal activity, musculoskeletal stress markers (MSM) and osteoarthritis (OA). This first indicator of activity, MSM (alternatively called entheses), was used because muscles work like bony levers for the underlying skeleton, where a person builds muscle, so can attachment points on bones grow and strengthen. Prior medical and bioarchaeological research (Benjamin et al., 2006; Bridges, 1991b; Bridges, 1995; Emslander et al., 1998; Larsen, 1995; Larsen, 2001; Larsen, 2015; Larsen et al., 2001; Milella et al., 2015; Ruff, 2000; Villotte et al., 2010) has determined that certain tasks, like farming, show an increase in muscle mass over an individual's lifetime. MSM can also help identify directional movement in the kinds