The prevalence of trauma in the Dunning Cemetery Population (1849 – 1861)

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INTRODUCTION

During the 19th century, the Cook County Poorhouse and Asylum was opened to offer long-term refuge to extremely poor people in Chicago. The facility was located about 10 miles west of the city of Chicago at the junction of Irving Park and Narragansett roads (Grauer et. al, 2016). In 1991, an archaeological excavation took place to rescue a jeopardized portion of the associated cemetery, which dated from 1849 to 1861 (see Figure 1). Using data from the excavated population, and historical and archaeological documents, the presence of trauma and fractures was evaluated. The goal of this research was to provide insight into the lives, the environment, and interpersonal violence experienced by the individuals. Researchers such as Grauer & McNamara (1995), Steegman (1991), and Muller (2017), to name a few, have published their work exploring poorhouse populations throughout the United States in order to understand the life of marginalized groups in the past.

THE SAMPLE

In total, 120 individuals were excavated at the archaeological site in 1991 (see Figure 2). Data for this study was collected based on prior laboratory examination of the skeletons and incorporated archaeological and paleopathological analysis of each individual.

METHODS & TECHNIQUES

Macroscopic data was originally collected in 1991-1993 by Dr. A. Grauer. Data included estimating age at death using the Paleopathology Association Skeletal Database Committee Recommendation (Grauer & McNamara, 1995), which used the chronological development of deciduous and permanent teeth and epiphyseal union of secondary growth centers to determine age at death for juveniles. For adults, changes to the pubic symphysis, articular surface, and cranial suture closure were assessed. Sex was estimated for adult individuals using techniques developed by Ascadi & Nemerskeri (1970) and Phenice (1969). Indications of trauma, recognized by the presence of bone callus formation and/or fracture remnants (see Figure 3), were noted and recorded by anatomical area impacted, degree of healing, and presence of subsequent infection. This study relied on published and unpublished data.

RESULTS

Skeletal Analysis

The demographic assessment of the population indicated that children under the age of 10 constitute the highest proportion of the population (n=34, 28.3%) (see Figure 4). While those in the 20 to 25 years old range make up the next highest percentage (n=20, 16.7%). Adults who were impossible to determine age at death comprised 14.2% (n=17) of the population. There are more female (n=37, 30.8%) than male skeletal remains (n=33, 27.5%) found in the population. Trauma was noted in 14 individuals (see Table 1), with 5 individuals displaying more than one fracture or incidence of trauma. Adults 35 to 45 years old have the highest number of individuals with fractures (6 out of 12 individuals, 50%). Individuals 25 to 35 years old displayed the next highest frequency (2 out of 11 individuals, 18.2%). There are more males (n=7, 50%) than females (n=6, 42.9%) with fractures within the 14 individuals whose sex could be estimated.

Trauma was noted 21 times (see Table 2) in 14 individuals. Fractures were most common and equal in upper extremities (n=7) including hands and lower extremities including feet (n=7) (see Figures 5a & 5b).

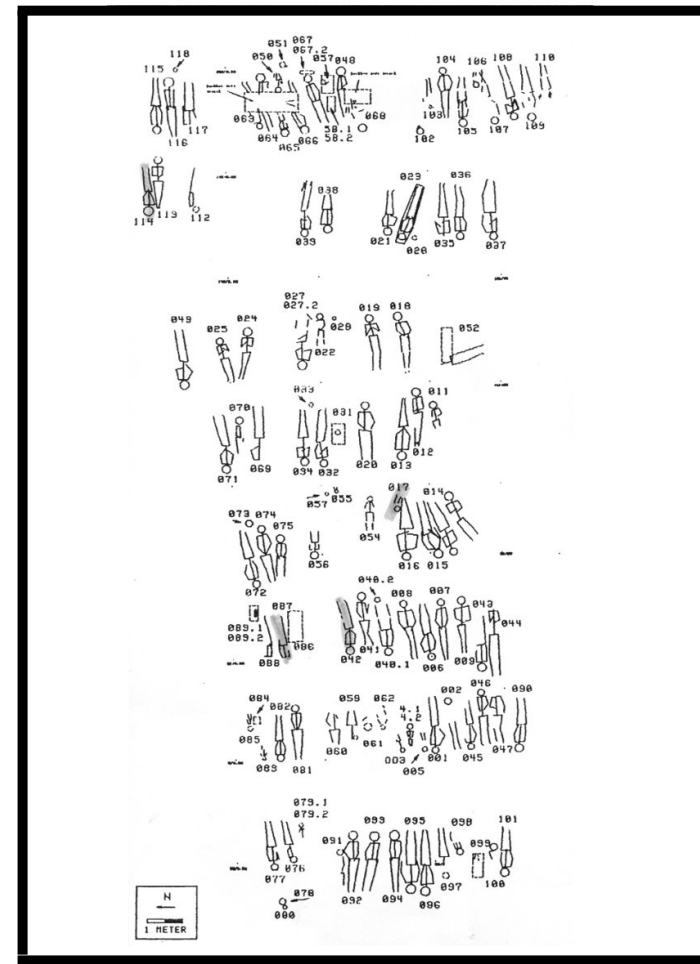
Figure 1. Excavated grave in the Dunning cemetery

Figure 2. Dunning cemetery excavation map

Figure 3. Rib fractures in different healing stages (Copyright © 2019 Cooper et al.)
A. Stage 1: Hematoma formation (cannot be seen in the image), B. Stage 2: Fibrocartilaginous callus formation (internal and external), C. Stage 3: Callus ossification, D. Stage 4: Bone remodeling
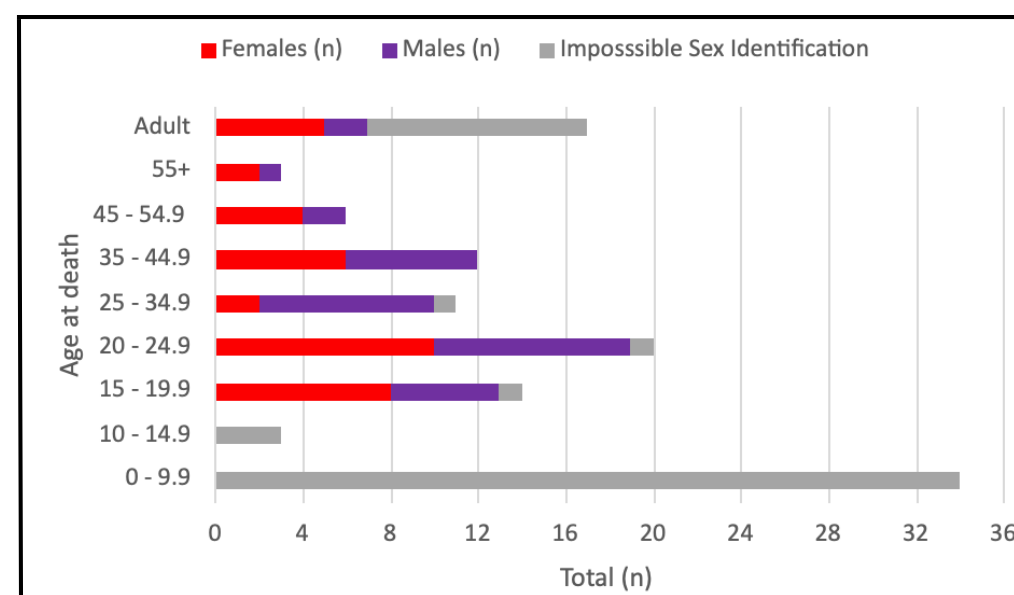

Figure 4. Mortality patterns of skeletons from the Dunning cemetery population

Anatomical Area	Frequency (n)
Cranial	2
Ribs	3
Vertabrae	2
Upper Extremities w/ Hands	7
Lower Extremities w/ Feet	7
Total	21

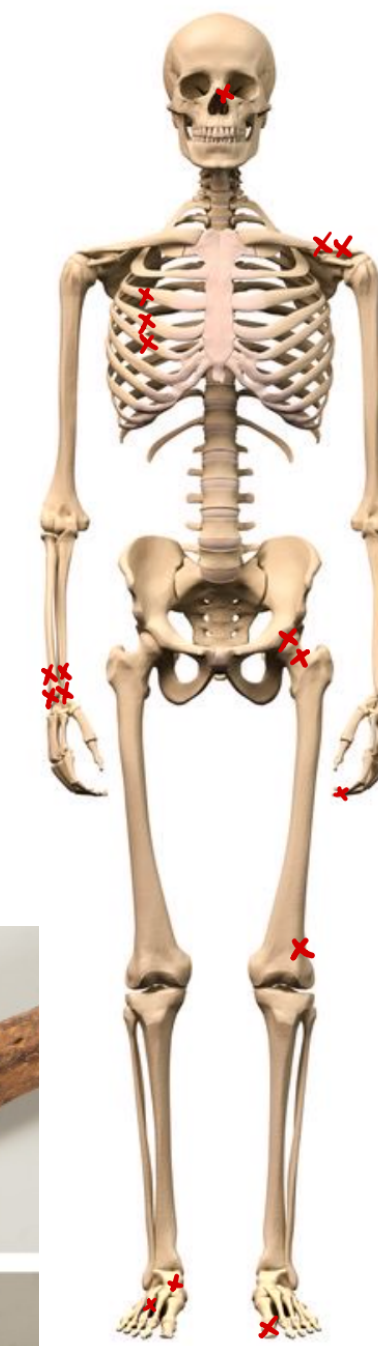**Table 2.** The frequency of fractures displayed by individuals in Dunning cemetery

Figure 5a. Location of fractures (n=21) present in 14 individuals in the Dunning cemetery population (anterior view)

Figure 5b. Location of fractures (n=21) present in 14 individuals in the Dunning cemetery population (posterior view)

Age at death	Total (N)		%	Females (n)		Males (n)		Impossible Sex Determination	
	w/ Fractures	n		w/ Fractures	n	w/ Fractures	n	w/ Fractures	n
0 - 9.9	0	34	0.0	0	0	0	0	0	34
10 - 14.9	1	3	33.3	0	0	0	0	1	3
15 - 19.9	0	14	0.0	0	8	0	5	0	1
20 - 24.9	3	20	15.0	1	10	2	9	0	1
25 - 34.9	2	11	18.2	1	2	1	8	0	1
35 - 44.9	6	12	50.0	2	6	4	6	0	0
45 - 54.9	0	6	0.0	0	4	0	2	0	0
55+	1	3	33.3	1	2	0	1	0	0
Subtotal	13	103		5	32	7	31	1	40
Adult	1	17	5.9	1	5	0	2	0	10
Total	14	120		6	37	7	33	1	50

Table 1. Age and sex distribution of individuals displaying bone fracture in the Dunning cemetery population

DISCUSSION

It is critical to examine a couple of questions: what do the trends tell us about the Dunning population and does our data show any bias?

Firstly, our data is biased, since the individuals who were examined are only those who died and were buried in the poorhouse cemetery, we do not get to see those who were living at that time. Children constitute the highest percentage of recovered individuals in the archaeological sample. There could be many reasons behind this. During the 19th century, poorhouses were used as a place for abandoned or orphaned children (Reef, 2005), as well as many single mothers. Of the sample assigned sex, 30.8% (n=37) are female and 27.5% (n=33) are male, the difference is not statistically significant. According to Grauer et. al. (1998), more men were recorded entering the facility, while many of them came and went due to job opportunities. Women stayed long-term. Poorhouses provided a place to work at a time when many careers were closed to them (Reef, 2005).

The pattern of sex distribution of individuals displaying bone fractures is similar (n=6, 42.9% are female and n=7, 50% are male). All the fractures were completely healed. The majority of fractures were noted in the following three adult age categories: 20-25, 25-35, and 35-45 years old. What the fractures may indicate is that many of the individuals in the Dunning cemetery population were disadvantaged (Grauer et al., 1998). It could also indicate that individuals suffered from stressful upbringings and suffered fractures before entering the poorhouse. Looking at modern population fracture data, (specifically upper extremities) distal radial and ulnar fractures are the most common, with 16.2 fractures per 10,000 people (Karl, 2015). 33.3% of all fractures occurred to the arms and hands. It is also interesting to note that cranial and rib fractures were found, which are often associated with interpersonal violence.

CONCLUSION

The archeological sample from the Dunning cemetery was excavated and analyzed about 30 years ago. This study posed new questions about poorhouse populations and indicated that fractures and trauma were quite common. Further exploration of poorhouse populations through skeletal analysis and documentation will be conducted to compare the Dunning cemetery population with other 19th century populations and to explore whether fractures led to infection and/or degenerative joint disease in this group. Ultimately, I seek to create a snapshot of life in the past through working in the CURA scholar program at Loyola University Chicago and under the direction of Dr. Grauer.

ACKNOWLEDGEMENTS

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