
REVIEW

Paleopathology Association 2017 Meeting New Orleans

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The 44th annual North American meeting of the Paleopathology Association (PPA) was held in New Orleans on the 18th–19th of April. The conference included a range of themes including a podium symposium “Vitamin D Deficiency: New Perspectives Under Past Light”. The papers and posters presented at the conference detailed a range of applications of pathological research, methodological considerations and the future of palaeopathological research.

Keywords: Paleopathology; Vitamin D; Rickets; Diagnostic Criteria; Bioarchaeology; Methodology

The 44th annual North American meeting of the Paleopathology Association (PPA) was held in New Orleans on the 18th–19th of April. Researchers presented a range of papers and posters, detailing the value palaeopathological studies have to increasing our understanding of past populations, discussing new methodologies for the future of palaeopathological research.

The first session commenced with Simon Mays whose presentation argued that bioarchaeological studies should not borrow theoretical frameworks from medical fields, and urged for more consideration to be taken with regards to utilising reference collections for bioarchaeology studies when testing palaeopathological diagnostic criteria. Later studies also urged caution when utilising reference collections; Molly Zuckerman discussed the potential socio-economic status

bias of reference collections, and how relying on these collections when developing palaeopathological diagnostic characteristics may influence future studies. Furthermore, Stephanie Atkinson urged researchers to rethink earlier assumptions, and to consider the impact of using clinical data for bioarchaeological studies, specifically with regards to the potential influence of vitamin D deficiency on the appearance of pathological lesions by influencing osteoclast and osteoblast activity.

Research presented also proposed new pathological diagnostic methods and criteria, and the implication this may have on palaeopathological studies. Ceridwen Boston and Catherine Sinnott presented research which determined that the inclusion of ectocranial orange peel porosity in the diagnostic features of scurvy increased the recorded prevalence of scurvy among skeletal remains of British soldiers to 20%. Moreover, Laura Castells Navarro and Jo Buckbery suggested the use of a four-stage differentiation of DISH

starting with isolate outgrowth which was labelled pre-DISH, future work will include isotope analysis to investigate dietary differences between assemblages.

Several of the papers presented at the PPA incorporated historical reports with palaeopathological analysis, arguing for future research not to be restricted to focussing solely on osteological analysis. Simon Mays discussed the limitation of bioarchaeological prevalence studies and argued for the inclusion of historical texts in bioarchaeological studies. Antonio Fornaciari and colleagues presented their research investigating Duke Federico of Montefeltro which demonstrated the value of combining different forms of data alongside osteological analysis. Their presentation detailed historical letters between the Duke and his physician which corresponded to the bioarchaeological evidence of gout. Similarly, Frank Rühli and colleagues presented their research which utilised a multidisciplinary approach, including historical reports alongside osteological analysis of Charlemagne. This approach suggested that Charlemagne was afflicted by a mean consumption related rheumatic disease such as gout. Combining historical data with osteological analysis not only supported a gout diagnosis but also how this pathology may have been experienced in life. Uhl presented research relating to vitamin D deficiency in non-humans, urging researchers to consider historical evidence such as droughts and husbandry strategies when analysing vitamin D and rickets. This relationship can then be applied to analysis of environmental and behavioural changes among human bioarchaeological studies. These studies illustrated the value of combining historical reports and letters with bioarchaeological analysis. Rachel Ives presented the findings of a study that compared recorded cause of death from historical reports with skeletal evidence of active, healing and healed rickets, and found that gastrointestinal and respiratory diseases were more commonly recorded as the cause of death among individuals with active rickets. Other interdisciplinary

research was presented by Johnica Morros, E Grady and Karl Reinhard who examined the human animal parasite relationship from the analysis of dog coprolites at a La Cueva de Los Muertos Chiquitos, Durango, Mexico. This research suggested an association between parasites which cause diarrhoea in dogs and the high child mortality found at the site.

Research at the PPA also investigated the prevalence and distribution of palaeopathological lesions as a means of inferring behaviour, including Jennifer Byrnes and Kevin Knowles's paper which assessed the prevalence of avulsion fractures among juveniles. Their osteological analysis of 218 juveniles from a cemetery low socio-economic status individuals found that the majority of fractures were present on the hands and feet (80%), which was argued to relate to physical activity. Derek Boyd and Colleen Milligan, presented their research which found that fracture healing did not differ significantly between high and low status Londoners. Rebecca Gilmour, Tracy Prowse and Erik Jurriaans, however, warned about the tendency to relate skeletal trauma to physical activity by detailing a study of the cortical thickness of bones with different fracture types which found no evidence that fractures resulted in a reduction in skeletal function based on cortical bone thickness.

The second day of the conference started with a special symposium organised by Megan Brickley "Vitamin D Deficiency: New Perspectives Under Past Light". During this symposium, researchers presented a range of studies which investigated vitamin D deficiency among different assemblages, which indicated factors influencing vitamin D in past populations. Megan Brickley and colleagues presented a study that analysed active and healed rickets among Roman sites in Europe at different latitudes and found that there was a higher prevalence of rickets among northern sites, although rickets was widespread in Roman Europe. The only paper to focus on osteomalacia was presented by Hallie Buckley, Annie Snoddy and Sian Halcrow, which suggested that poor nutrition brought about by natural disaster or

human imposed resulted in vitamin D deficiency among the Cook islanders at Rima Rau cave. Barbara Veselka and colleagues demonstrated the complex role of socio-economic, status and gender differences in the prevalence of rickets in their study which investigated the prevalence of rickets among urban and rural post-medieval Dutch sites. Veselka and colleagues encouraged future research to consider the prevalence of rickets among urban and rural sites, to enhance understanding of socio-economic influences in vitamin D deficiency. Toni Ziegler presented research which determined a correlation between vitamin D levels among non-human primates with differing skin and hair colour. While this correlation was expected, and fitted with vitamin D research, it was clear that skin and hair colour were not the only factors influencing vitamin D among the monkeys sampled. Furthermore, a higher level of vitamin D among captive monkeys compared to wild indicated that the diets of captive species were higher in vitamin D compared of wild, obscuring the impact of lower levels of UVA vitamin D. Presenters also suggested new directions for the palaeopathological analysis of vitamin D research. For example, Glenville Jones proposed researchers to consider not just vitamin D deficiency but also the effects of vitamin D overdose, by looking for evidence of renal stones; as well as for analysing DNA to understand the potential genetic component in vitamin D deficiency. After this Elizabeth Uhl discussed different expressions and causes of vitamin D among non-human animals, such as considering the impact of vitamin D deficiency in phosphate and therefore recording skeletal manifestation of phosphate deficiency such as fibrous osteodystrophy presentation. This symposium concluded with Nina Jablonski's presentation which highlighted behavioural adaptations which moderated low levels of UVB vitamin D, as well as how modern behaviours are increasing the prevalence of vitamin D deficiency.

Further interesting research included paper presented by Myra Miller which examined

pathological lesions associated with pellagra. Among the results of this study it was found that there was a lower prevalence of caries among individuals with skeletal lesions which were consistent with a pellagra diagnosis. Alysha Lieurance, Mallory Provan and Megan Perry discussed the palaeopathological diagnosis of two individuals from the Late Ottoman period in the Levant in their presentation. Nataša Šarki and colleagues presented their research recording pathological lesions among assemblages of cloistered nuns between the 16th and 20th century the prevalence and type of pathological lesions present as well as evidence of medical treatment changed over time. Claire Hodson and Rebecca Gowland followed this with their research which found a correlation in increased disparities in dental and long bone age estimation with the prevalence of pathological new bone growth among infants. No significant differences were noted in delayed long bone growth or pathological lesions among archaeological sites of differing social status, suggesting that even among high status groups maternal and infant health was poor. New methodologies were also presented at the PPA, for instance Kirsten Bos and colleagues illustrated the value of new DNA sequencing methods in the analysis of ancient bacterial DNA and the exciting future of this field.

The research presented at the 44th annual PPA meeting discussed the current issues and the development of palaeopathological research, demonstrating the wide range of pathological lesions which can be investigated in bioarchaeological analysis and what this can tell us about disease and behaviour among past populations. The conference thereby demonstrated how relevant this research is, as this knowledge can then be applied to living populations such as those with the current increase in vitamin D deficiency and rickets.

Competing Interests

The author has no competing interests to declare.

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