

THE EFFECTS OF EARLY LIFE ADVERSITIES ON CHILDREN FROM TWO POPULATIONS: CASAL BERTONE (RM, 1ST-3RD C.E.) AND LEOPOLI-CENCELLE (RM, 9TH-16TH C.E.)

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The study on childhood in the period between Ancient Rome and the Middle Ages has also recently expanded in relation to high infant mortality. Children were not excluded by harsh living conditions: high population density, poor hygiene, contact with pathogens and poor parental care. Their bodies are more fragile, this made the study of children very difficult. In this sense, bioarchaeology and paleopathology have refined approaches toward biological materials characterized by a high level of fragility. In particular, the children's exposure to repeated stressors can affect body development, this means that the genetic predisposition to develop certain anthropometric characteristics is influenced by environmental factors, limiting genetically regulated phenotypic expression. The imaging diagnostics for the examination of bone structure and implementing the expertise in the advanced post-processing techniques will be useful to explore the consequence of changing stress in a long-term perspective and Bone Mineral Density. By exploiting these data in the context of polygenic inheritance, we will provide a new approach to characterize the biological background of ancient populations and investigate the molecular mechanisms involved in stress vulnerability.

In this regard, the aim of my PhD project is to compare the effects of early childhood adversity between Roman Imperial Period and Middle Ages with well attested and documented harsh and different life conditions. This research will be integrating the ancient paleogenomic data and skeletal information to explore the polygenic architecture of traits that characterize children's health status, and it is a part of a multidisciplinary PRIN 2022 project: "Early-life adversities: writing a biological history of childhood through a transdisciplinary approach".

For my analysis, I'll focus on a 30 children's sample from the site of Casal Bertone (Rome, 1st-3rd century C.E.) and 30 from Leopoli-Cencelle (9th-16th century C.E.), aged from 0 to 19, that will be selected based on the state of preservation and the number of samples will be representative for each age group. The first step is the identification of morphological markers of stress. The child samples recruited will be submitted to ancient DNA analysis to explore the genetic composition of the populations and determine the molecular sex. The DNA will be extracted using silica-based extraction method. The Illumina double-stranded libraries will be shotgun sequenced and applied imputation to adequately account for missing data due to aDNA limitations. The outcome of this project is therefore to explore how children cope with adequate growth in stressful conditions in a diachronic perspective, that can be read as a degree of human adaptation to the environment.