H30 Juvenile Idiopathic Arthritis, Pharmacological Treatments, and the Potential for Individuation in Forensic Anthropology

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After attending this presentation, attendees will be able to identify common growth abnormalities and degenerative changes associated with juvenile idiopathic arthritis and some of the pharmacological treatments used to treat the disease. The attendee will also have an appreciation for the changing face of skeletal pathology in light of advancing pharmacological treatments.

This presentation will impact the forensic community and/or humanity by shedding light on not only the importance of the study of skeletal pathologies such as juvenile idiopathic arthritis, but also encourage the investigation of modern pharmacology and its effect on the skeleton and forensic anthropology.

The goal of this presentation is to present the forensic community with an evaluation of the classic osseous changes seen in juvenile idiopathic arthritis, the osseous changes caused by the medications used in treatment, and to present the need for re-evaluation of skeletal pathologies and effects of modern medications on the growing skeleton.

This work will present the results of a thesis written for a Master of Science degree in Forensic and Biological Anthropology at Bournemouth University. This thesis is an evaluation of the past literature of representative skeletal lesions and current literature on common pharmacological treatments and outcomes of juvenile idiopathic arthritis.

One in one thousand children are affected by some form of arthritis. One of these forms, juvenile idiopathic arthritis, develops before the age of sixteen, involves inflammation of the joints, and has no known cause. Unlike arthritis in adults, juvenile idiopathic arthritis affects the skeletal system differently than adult forms of arthritis because the skeleton is still growing and developing. Not only do degenerative changes such as erosions and ankylosis occur in juvenile idiopathic arthritis, but stunted growth of the bones also occurs. Chronic inflammation may be the cause of growth disturbances in the mandible, long bone epiphyses, and phalangeal epiphyses.

The pharmacological therapies used to treat the inflammatory and autoimmune manifestations of this disease also have effects on the skeleton. The purpose of the pharmacological treatments is to reduce inflammation in affected area, and in some cases halt the progression of the disease. Corticosteroids, such as prednisone, have potent anti-inflammatory effects, but also halt growth, and promote the development of osteoporosis. Methotrexate and etanercept slow the radiographic progression of bone erosion in studies on adult arthritis, and may also have the same effect in juvenile idiopathic arthritis. Recombinant human growth hormone is often used to combat the effects of the growth cessation due to the disease and its treatments.

Pathological conditions, like juvenile idiopathic arthritis, sometimes leave specific patterns of lesions on the skeleton. Forensic anthropologists can augment their analysis and identification of an individual by looking for these patterns of lesions. Juvenile idiopathic arthritis has the potential of being this kind of individuator. There are no growth abnormalities or skeletal manifestations that are pathognomonic of juvenile idiopathic arthritis, but severe cases of the disease may be able to be identified by a forensic anthropologist. The pharmacological treatments of this disease, however, may hamper the diagnosis by the forensic anthropologist. Currently, the knowledge of and treatment of juvenile idiopathic arthritis is evolving, and this will affect the appearance of the lesions on the bones. Consequently, the usefulness of juvenile idiopathic arthritis as an individuator will change as treatment regimens progress.

The changing faces of juvenile idiopathic arthritis and adult rheumatoid arthritis in response to rapidly improving pharmacological treatments serve as examples of the changes that paleopathologists and forensic anthropologists will need to make to identify classical signs of disease. Additionally, the future of anthropological analysis will be affected by not only the treated conditions, but by the treatments themselves. The forensic community should be aware of the evolution of pharmacological treatments and their beneficial and deleterious effects for future casework.

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