Immunohistochemical expression of type III collagen in the articular disc of the temporomandibular joint of human fetuses in the second quarter of gestation: preliminary results

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The articular disc is a structural component of the TMJ. It is dense, contains collagen fibers, and is adapted to the bone surfaces above and below it. Since the maxillary surface is convex and the temporal joint surface is concave and convex, they do not correspond. Thus, the congruence is established by the interposition of an articular disc. Type III collagen is found mainly in the kidneys, aorta, liver, thymus, skin, stomach and myotendinous junctions. The native molecule of this collagen is trimerous, that is, it consists of three chains [alfa3 (III)]3. Because of its crossed intramolecular sulfur-sulfur bonds and its high molecular weight of roughly 300,000 Daltons, type III collagen has a limited mobility. After reducing treatments, its molecular weight drops to 100,000 Daltons, which results in better mobility. This is an important property to characterize this collagen. Type III collagen has within its molecule high indices of the amino acid glycine, a higher proportion than that found in other collagens, and this leads to instability of the triple helix and thus renders the molecule more susceptible to enzymatic action. It has also been demonstrated by the use of monoclonal antibodies, that type III collagen can be associated with other kinds of collagens forming heterotypic fibrils in many tissues. Given the small number of studies that focus on the morphological aspects of the types of collagens that exist in the articular disc of the temporomandibular joint of human fetuses, we believe that a better structural knowledge is necessary regarding the relationship between these proteins and the articular disc of the TMJ. Thus, the objective of our work is to study the immunohistochemical expression of type III collagen antibody in the articular disc of the TMJ of human fetuses in different gestational ages. Until the present time, the TMJ of 3 human fetuses with gestational ages from 13 to 24 weeks of intrauterine life from the Federal University of Uberaba have been studied. The ages of the fetuses were determined by measuring the crown-rump length (CRL). Macroscopically, the fetuses were fixed in a 10% formalin solution and dissected by removing the skin and subcutaneous tissue, exposing the deep structures. For the microscopic analysis of the collagen fibers, a monoclonal marker was used (rabbit anti-human type III collagen from Novotec – USA, at a dilution of 1:500). Preliminary results of our research show a higher concentration of type III collagen fibers located in the upper and lower faces of the articular disc. Until the present time it is possible to conclude that the analysis of the immunohistochemical expression of type III collagen antibody is positive for the presence of these collagen fibers in the articular disc, especially in the upper and lower faces, forming a network of heterotypical fibrils together with type I collagen fibers.

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