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DEVELOPMENTAL FEATURES OF THE ANTERIOR NECK TRIANGLE IN HUMAN FETUSES DURING PRENATAL PERIOD OF HUMAN ONTOGENESIS

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Anatomical spaces found in the anterior neck region are the clinical landmarks for the possible spreading of inflammatory (reactive adenopathy or the soft tissues inflammation), odontogenic, traumatic, congenital, or oncological pathologies. Taking into consideration the fact that congenital malformations of the neck originate from embryological tissue during the prenatal period of ontogenesis, knowledge on normal morphogenesis will allow us to understand possible ways of their formation and improve their effective detection and treatment.

That is why the aim of our research was to investigate and circumscribe morphometric and developmental features of the anterior triangle of the neck in human fetuses during the prenatal period of human ontogenesis.

Totally 12 specimens of human fetuses aged from 4th to 10th month (85,0-350,0 mm of parietal-coccygeal length (PCL)) of intrauterine development (IUD) have been investigated by means of morphological methods: macroscopy (under the control of binocular microscope), microscopy, morpho- and anthropometry, statistical analyses. The study was performed in accordance with the provisions of the declaration of Helsinki (1995) as revised in Edinburgh (2000), ICH GCP (1996), and had been approved by the Bukovinian State Medical University Ethics Committee.

We have observed that multilayered configuration of the neck can be seen in 90,0 mm PCL fetus, as deep cervical fascia has developed its subdivisions: superficial, visceral, and deep layers, accordingly. Fascial layers create fascial tissue spaces that can be distinguished at the early stages of the fetal period (85,0; 100,0 mm PCL fetuses and on) as they unfold some volume of the fatty tissue. Clinically, these spaces may be involved in spreading inflammatory pathologies of the neck by means of soft tissues. The area of the anterior neck triangle is a considerable index, as it generalizes the content volume of the strap-like infrahyoid muscles: omohyoid, sternohyoid, thyrohyoid, and sternothyroid as well as magistral blood vessels and some visceral organs. The area index (mm²) of the anterior neck triangle (index dependence depicted by formula $(-713,8855+218,2721*x)$) in human fetuses of 4th – 10th month of IUD (90,0; 360,0 mm PCL) shows the increasing tendency throughout the fetal period of IUD with the highest rates at 8th–10th months period – 1200,0±20,0 mm². We have also noted a direct relationship of the increasing fetal age to the area of the anterior triangle with moderate index deviations within each month of the examined specimens. A significant feature in anterior triangle development is its area index reaching peak points around 8,5-9th months of IUD (290,0; 300,0 mm PCL fetuses). In spite of the above-mentioned fact of the highest indicators during 8,5-9th months of IUD, the critical period of the anterior triangle of neck development should be considered 7th month of IUD. This can be explained by the highest intensity of bony structures development (morphometric indexes of mandible, clavicle, and sternum) as well as the critical period for muscular (infrahyoid group of neck muscles, sternocleidomastoid), vascular, nervus (ansa cervicalis) and fascial structures late intrauterine modification and histological maturation.

As a result, we may conclude that: 1. The early fetal period of human prenatal development is characterized by the multilayered configuration of fascial layers and spaces; 2. An increasing tendency of the anterior neck triangle area index is observed throughout the fetal period; 3. The 7th month of intrauterine human development can be considered the critical period for anterior neck region development.