INTRODUCTION
Chronic inflammatory diseases of the mucous membranes of the nose, paranasal sinuses, and pharynx are the most common pathology of the upper airways. Currently, a substantial increase of this pathology in both absolute figures and its incidence is noted in the structure of general ENT-morbidity [1].

Air pollution, increased incidence of the respiratory viral infections and allergens contribute to the growth of the diseases of the mucous membrane of the nose, paranasal sinuses and pharynx [2].

Notably, the paranasal sinusitis account for about a third of ENT-pathology. Pathological processes develop more often in the maxillary and ethmoidal sinuses; frontal sinuses are affected relatively rarely, but the clinical course of frontitis is more severe and quite often (from 0.8 to 3%) is accompanied by the severe intraorbital or intracranial complications. The severity of frontitis is resulted from the variability of the structure of the frontal sinuses and intranasal structures, which can be accompanied by narrowing of the nasal passages and impaired ventilation of the paranasal sinuses [3-5].

Individual anatomical features of the structure of the frontal sinuses, variable symptoms of their pathological processes, the difficulty of the examination and treatment require the improvement of the current and developing of the novel methods of diagnostics [5].

THE AIM
The paper was aimed at the analysis of the publications on current data related to the structure and functions of the human frontal sinus and its structural components.

MATERIALS AND METHODS
The bibliosemantic method has been used during the study. Findings of the current research works on the study of the human frontal sinus have been analyzed.

REVIEW AND DISCUSSION
Nowadays, the arsenal of the powerful research methods, including spiral computed tomography, computer craniometry, magnetic resonance tomography, laser spectroscopy, 3D technology, etc. is currently used to study the structure and functions of the frontal sinus and diagnosis of pathological
processes [6-12]. However, classical methods of morphological study are still relevant in the study of topographical-anatomical features of the human frontal sinus. In this way, craniometric study, conducted at the Department of Clinical Anatomy and Operative Surgery of the Ukrainian Medical Stomatological Academy, showed that human frontal sinuses have a considerable range of individual differences in the shape and size. More often these sinuses are located closer to the median line, have different length in the sagittal direction, sometimes continuing in the intramural portion of the frontal bone. Generally, the left frontal sinuses are larger than the right ones. Superiorly, the frontal sinuses insignificantly came over the supraorbital ridges, laterally, they reached the supraorbital foramen and posteriorly, occupied approximately the anterior one third of the upper wall of the orbit. In several cases the frontal sinuses significantly extended in the lateral direction, had extra inlets or septa. Morphometric studies have revealed a wide range of individual variability of the linear dimensions of the frontal sinuses, which were larger in men in contrast to women, though had no statistically significant difference (p > 0.05). In men the biggest sagittal size of the right and left frontal sinuses was 23.4 mm and 22.68 mm, respectively, and their smallest sagittal size was 8.62 mm and 8.589 mm, respectively. In men the height of the right and left frontal sinuses ranged from 35.56 to 12.02 mm, and from 34.08 to 12 mm, respectively. The transverse size varied, too: 32.54±20.22 mm for the right frontal sinus, and 32.58±20.44 mm for the left sinus. In women the biggest sagittal size of the right and left frontal sinuses was 22.22 mm and 23.24 mm, respectively, and their smallest sagittal size was 8.44 mm and 7.94 mm, respectively. In women the height of the right and left frontal sinuses ranged from 34.36 to 9.22 mm, and from 32.79 to 12.22 mm, respectively. The transverse size varied, too: 32.43±19.8 mm for the right frontal sinus, and 32.08±19.76 mm for the left sinus [13].

 Inferiorly, the intersinus septum, which separates the right and left frontal sinuses, is located mediially more often, and, superiorly, can be deviated aside. Near the septum on the lower wall of the frontal sinus there is the opening of the frontal nasal duct that more often opens into the anterior part of the crescent-shaped fissure of the medial nasal passage. In some cases, the frontal sinus opens into the nasal cavity with the opening, but not with a duct [14, 15].

A thorough study of the morphology of mucous membrane of the frontal sinus is extremely relevant to date. Currently, for example, it is known that in 87% of cases very common cysts of the maxillary sinuses are considered to be "unreal," the reason for their occurrence is the degenerative changes in the mucous membrane. Speaking about the cysts of the frontal sinuses, too little information has been found to date in the medical scientific publications; the clinicians describe a similar pathology more often as the cases of muco- or pyoceal dermoid cysts. At the same time very rarely this pathology has been confirmed by the findings of morphological studies, which is a significant drawback, since the analysis of the morphological features of cysts of the frontal sinuses permits to develop the maximum sparing surgical techniques for their removal [16, 17].

The comparative morphometric analysis of the thickness of the epithelium of mucous membrane of the posterior wall and septum of the human frontal sinus confirmed the absence of significant differences between the values of the left and right frontal sinuses. Its mean thickness on the septum was 36.01±1.23 μm on the left and 35.21±1.31 μm on the right and was insignificantly bigger than on the posterior walls of the frontal sinuses. The mean thickness of the proper lamina of the mucous membrane of the septum was also slightly bigger as compared to the posterior wall (26.56±1.54 μm on the left and 27.06±1.36 μm on the right), but the difference was insignificant. The thickness of the submucous layer was 10% bigger on the septum (127.17±8.48 μm on the left and 124.93±7.89 μm on the right) which differed insignificantly from the similar value on the posterior wall (111.17±9.77 μm on the left and 115.47±6.48 μm on the right). The outer diameter of the acini was significantly smaller by 15% on the septum (25.42±1.68 μm on the left and 25.89±1.38 μm on the right), as compared to the posterior wall (29.77±2.07 μm on the left and 30.17±2.25 μm on the right). The mean values of the diameters of the lumens of vessels of the mucous membrane of the posterior wall and septum of the frontal sinus, except for the venules, were significantly different and were bigger on the septum; in this way the mean diameter of the veins and arteries of the posterior wall was 35% and 70%, respectively, smaller [18].

The glands, regional peculiarities of which are the various nature of secretion and histofunctional differences of the acinar and ductal epithelial cells and tinctorial properties of the content of ducts, have been detected in the mucous membrane of all walls of the human frontal sinus [19]. Compound branched glands, containing the acini and excretory ducts, are located in the submucous layer of the frontal sinuses mucosa. Submucous layer is formed by the loose fibrous connective tissue with dense network of blood microvessels, surrounding the glands. The acines are formed by the cuboidal cells, the cytoplasm of which contains numerous secretory granules, consisting mainly of proteins. The nuclei of these cells, mainly orbicular and sometimes with minor invaginations contain chromatin and mainly one eccentric nucleolus. In the acini among cuboidal cells the sporadic cambial cells with dark homogenous cytoplasm and small orbicular nucleus have been found. The sporadic lymphocytes in the basal parts ensure a barrier function of the glands of the frontal sinuses mucosa. The fibroblasts form the gentle capsule around the acini. The excretory duct is formed by 2-4 acini and lined with 1-2 layers of cuboidal epithelial cells, nuclei of which are located in the center of the cell, containing one eccentric nucleolus. The excretory ducts carry the secretion from the acini to the surface of the frontal sinuses mucosa. The external layer of these ducts consists of myoepithelial cells, surrounded by a loose connective tissue, which contains mainly fibrillar component and sporadic fibroblasts [20].

The morphometry has shown that in the mucous membrane of the anterior wall of the human frontal sinus the mean value of the outer diameter of acines of the serous glands of the anterior wall of human frontal sinus was (26.81±2.06) μm; the mean value of the diameter of the lumen was (5.56±0.16) μm; the mean value of the height of the epithelial cells was...
Histological studies have revealed that in the submucous layer of the inferior wall of the human frontal sinus the acini of the serous glands are formed by the prismatic cells, cytoplasm of which contains numerous secretory granules. The nuclei of these cells are orbicular and contain mainly decondensed chromatin. The mean value of the outer diameter of the acini of the serous glands of the inferior wall of the human frontal sinus is (34.17±2.39) μm, which is significantly greater than the value on the anterior wall (p<0.05). The mean value of the height of the epithelial cells is (12.24±0.98) μm, and the mean value of the diameter of the lumen is (11.67±0.84) μm that is significantly greater than the similar values on the anterior wall of the human frontal sinus (p<0.05). The mean value of the outer diameter of the excretory ducts of the serous glands of the human frontal sinus inferior wall is (42.90±3.12) μm and is significantly greater than the value on the anterior wall (p<0.05). The value of the diameter of the lumen is (17.16±0.86) μm and differs insignificantly from the value on the anterior wall. The mean value of the height of the epithelial cells is (12.87±1.31) μm that is also greater than the similar value on the anterior wall (p<0.05) [21, 22, 23].

Serous glands in the mucus membrane of the posterior wall of the human frontal sinus are compound, branched and consist of acini and excretory ducts. The mean value of the outer diameter of the acini of the serous glands of the human frontal sinus posterior wall is (30.49±1.97) μm. The value of the diameter of their lumens is (7.93±0.22) μm (p<0.05). The mean value of the height of the epithelial cells is (13.28±1.04) μm that is greater than the similar value on the anterior wall (p<0.05), but differs insignificantly from the similar value on the inferior wall of the human frontal sinus. The mean value of the outer diameter of the excretory ducts of the serous glands of the human frontal sinus posterior wall is (37.53±2.87) μm, that is significantly greater than the value on the anterior wall but significantly lower than on the inferior wall (p<0.05). The mean value of the height of the epithelial cells is (4.88±0.32) μm, that is almost twice lower than the similar value on the anterior wall and 2.6 times lower than the value on the inferior wall of the frontal sinus (p<0.05). The value of the diameter of the lumen is (27.77±1.12) μm, that is considerably higher than the values on the anterior and inferior walls (p<0.05) [21, 22, 23].

In the mucus membrane of the septum of the human frontal sinus the value of the mean outer diameter of the acini of the serous glands is (24.90±1.08) μm, the diameter of their lumens is (5.02±0.01) μm, the mean height of the epithelial cells is (8.67±0.06) μm, that are the least values among all walls. The mean metric values of the serous gland ducts of the human frontal sinus septum are (32.28±1.18) μm for the outer diameter; (13.56±0.06) μm for the diameter of the lumen; (8.37±0.03) μm for the height of the epithelial cells [21].

Immunohistochemical studies are crucial in the study of the structure and function of the mucous membranes and their glandular apparatus [24].