

SUMMARY AND CONCLUSION

In the present work we studied the effect of unilateral and bilateral nostril closure on the nasal and middle ear mucosa in experimental animals. The rat was chosen because of the similarity of the drainage scheme of the rat middle ear to that of human and because of the striking similarity of the rat mucosa to that of the human.

On the open side of the nose of the rats subjected to unilateral nasal obstruction, squamous metaplasia, vascular congestion and ciliary destruction were found in a more significant number of animals than on the closed side. These changes were seen localized to the anterior part of the nose.

On the closed side of the nose, there were no signs of epithelial damage as those seen on the open side. There were increased secretory activity in the form of increased subepithelial glands and goblet cells, in addition to increased mucosal thickness and this was seen in a more significant number of animals on the closed than on the open side of the nose. The changes of the nasal mucosa on the closed side were seen anteriorly as well as posteriorly.

The changes of the nasal mucosa were not constant. The previously mentioned changes were mild after one week and were more marked as time went by up to one month, then the changes became less marked again.

No changes of the middle ear mucosa were seen in the ears related to the open sides of the nose.

On the ears related to the closed side of the nose, after one week, no changes of the middle ear mucosa were seen. After 2 weeks 11.1% of animals showed vascular dilatation and oedema of the middle ear mucosa and after one month 16.6% showed changes of the middle ear mucosa. After 2 and 3 months, no changes of middle ear mucosa were seen.

In the animals subjected to bilateral nostril closure, the changes of the nasal mucosa were mild after 3 days and became more marked as time went by. There were increased secretory activity of the mucosa in the form of increased goblet cells and subepithelial glands.

The animals subjected to bilateral nostril closure could not withstand this obstruction for a long time and they died within a period of 3 to 9 days.

On examination of the middle ear mucosa in animals subjected to bilateral nostril closure, no changes were seen after 3 days. After 5 days, 2 out of 8 animals showed changes of the middle ear mucosa. Also 2 out of 8 animals showed changes of the middle ear mucosa after one week. After 9 days, 2 out of 6 rats showed changes of the middle ear mucosa. The changes of the middle ear mucosa were in the form of congestion and oedema after 5 days. After 7 days vascular congestion, oedema and squamous metaplasia were seen. After 9 days heavy inflammatory cellular infiltration, vascular congestion and mucoid fluid accumulation appeared.

From this study it can be concluded that abnormal increase of airflow in the nasal cavity is followed by signs of damage of the epithellum as cillary destruction with squamous metaplasia and vascular dilatation while abolishing airflow in the nose is followed by increase of secretory activity of the mucosa in the form of increased goblet cells and subepithelial glands with increased mucosal thickness.

It can be also concluded that a significant effect on the middle ear mucosa is not demonstrable during unilateral nostril closure that impair but does not abolish ventilation of the nasopharynx and the extension of inflammatory changes of the mucosa seem insufficient to elicit significant effect on eustachian tube function.

Bilateral abolishing of ventilation of the nose has a slightly more pronounced effect on the middle ear mucosa than unilateral nostril closure probably because in addition to mucosal oedema, decreased oxygen and increased carbon dioxide in the nasopharynx may play a role.

The changes of the nasal mucosa following exposure to an abnormal agent are not constant it seems that the mucosa tends to become normal again after a certain period of exposure to an abnormal agent.

From our results, we recommend the study of the effect of unilateral nostril closure on the nasal mucosa in cases of atrophic rhinitis.