The effect of nasal obstruction on the nasal and middle ear mucosa in experimental animals

Mosaad Yehia Abdel Aziz

In the present wOl’k we studIed the eCCect orunilateral and bilat.eral nost.ril closure on the nasal andmfddfe ear mucosa In experlment.al animais. ’l’he rat. was choosenbecause or the slmilarlt.y of’ the drainac;e scheme 01’ t.herat middle ear to that or buman and because or the sl.rlkh.c;similarity or the l’at. mucosa to t.hat or the human.On the open sIde of’ the nose or the rats subjected1.0 unilateral nasal obst.ructlon, squamous ,”el.aplasla,vascular conl’;esllon and ciliary dest.ruct.ion were f’ound in amore sic;nlrlcant. number or anImals than on the closed sIde.These chanc;es were seen locallzed 1.0 I.he anl.erior parl. orI.he nose.On I.he closed side or I.he nose, I.here were no siC;nsof’ epithelial damac;eas t.hose seen on the open side. Therewere increased secretory actlvlt.y In the rorm 01’ IncreasedsubepIthelial c;lands and t;obiet cells, In addItIon t.oIncreased mucosal t.hlckness and t.hIs was seen In a moresIr;nlCIcant number 01’ anImals on t.he closed than on t.he opensIde 01’ t.he nose. The chanr;es 01’ t.he nasal mucosa on t.heclosed sIde were seen ant.erlorly as weHas posteriorly.The chanC’:es or t.he nasal mucosa were not. const.ant..The previously ment.ioned chanC’:es were mild af’t.er one weekand were more marked as t.ime went. by up t.o one 11’nt.h,t.hent.he chanC’:Etsbecame less marked a~ain.”..No chanC’:es or t.he middle ear mucosa were seen” int.he ears relat.ed t.o t.he open sides or t.he nose.On t.he ears relat.ed t.o t.he closed side of” t.he nose,af’t.er one week, no chan~es or t.he middle ear mucosa wereseen. Art.er 2 weeks 11.1% or animals showed vasculardilat.at.ion and oedema or t.he middle ear mucosa and art.er onemont.h 16.6% showed chan~es or t.he middle ear mucosa. Art.er 2and 3 mont.hs, no chan~es or middle ear mucosa were seen.In t.he animals subject.ed t.o bilat.eral nost.rilclosure, t.he chan~es of” t.he nasal mucosa were mild af”t.er 3days and became more marked as t.ime went. by. There wereincreased secret.ory act.ivlt.y of” t.he mucosa in t.he f”orm of”increased ~oblet. cells and subepit.hellal ~lands.The animals subject.ed t.o bilat.eral nost.ril closurecould not. wit.hst.and t.his obst.ruct.ion f”or a lon~ t.ime andt.hey died wit.hin a period of” 3 t.o 9 days.On examination ot: t.he mIddle ear mucosa In animalssubJect.ed t.o bilat.eral nost.ril closure, no chanlt;es were seenart.er 3 days. Arter 5 days, 2 out. of 8 animais showedchan~es of the middle ear mucosa. Also 2 out ot: 8 animalsshowed chanr;es of t.he middle ear mucosa aft.el’ one week.Af’Le r- 9 days, 2 out of 6 rats showed chan~es of t.he middleear mucosa. The chan~es of t.he middle ear mucosa were in t.heform ofvascularconr;estionconr;est.ion,and oedema aft.er 5 days. Aft.er 7 daysoedema and squamous met.aplasia wereseen.

Aft.er 9 days heavy inflammat.ory cellularinfilt.erat.ion, vascular con~estion and mucoid fluidaccumulation appeared.Pr-om t.his study it. can be concluded t.hat. abnormalincrease of airflow in t.he nasal cavit.y is followed by silt;nsof dama~e of thesquamous met.aplasiaepit.helium asand vascular.ciliary dest.ruction wit.hdilat.at.ion while abolishinlt;airflow in t.he nose is followed by increase of secret.oryact.lvit.y of t.he mucosa in the form of increased It;obiet. cellsand subepit.helial ~lands wit.h increased mucosal t.hickiness.t.he ear mucosa Ist.hat.not.a slc;nU-lcant. efTect.demonst.r'a!.Jle durlnc;onIt. canmiddleve also concludedunUat.eral rioes Lr-Uvent.lllat.loll ofclosure t.hat. ImpaIrt.he nasopharynx and!.Jut. does not. abolIsht.he ext.enslon oCInf1anllllat.ory chanl;es of t.he mucosa -seem InsufflcIent. Loellc1t. sIr;nificant. effect. on eust.achlan Lube funct.lon.Dllat.er al abollshlnr; oC vent.UIaUon of Lhe nosehas a sllC;hUy mor-e pronounced efTect. 011 U.e middle earmucosa t.han unllaLerai nosLrll closure pro•.a.•bly because inaddlt.lon Lo mucosal oedema, decreased oxYC;enand Increasedcarbon dioxide In t.he nasopharynx may play a role.'l'he chanl;es of t.he nasal mucosa foUowlnr; exposureLo all abnor'mal al;ent. aloe not. const.ant. It. seems LhaL t.hemucosa t.ellds Lo become normal ar;aln afLer a cert.aln periodof exposure Lo an abnormal ac;ent..from our result.s, we recommend t.he st.udy of t.heeffect. of unilat.eral nost.ril closure on t.he nasal mucosa incases of at.rophic rhinit.is-