

OBJECTIVE

Chronic rhinosinusitis with nasal polyps (NP) is often refractory to medical treatments requiring surgical intervention. The prevalence of NP increases with age. Age-related histological changes in NP versus sinonasal tissue from healthy controls were investigated.

METHODS

Sinonasal tissues from young (18-49 yr), mature (50-64 yr), and older adults (≥ 65 yr) with NP and from age-matched healthy controls were collected during surgery. Sinonasal tissues from young (2 months) and aged (24 month) mice were also obtained. For age related histopathological changes, tissues were embedded in paraffin, sectioned, and processed with periodic acid-Schiff (PAS) staining and Masson's trichrome staining.

RESULTS

The overall volume of submucosal glands and the proportion of mucus cells/serous cells in healthy subjects was increased with age. Goblet cell hyperplasia, a decrease in the volume of submucosal glands, and epithelial cell metaplasia with increased thickness of epithelial layer was observed in NP subjects versus healthy controls, regardless of age. There was significantly more goblet cell hyperplasia, increased thickness of the epithelial layer with increased eosinophil infiltration, and more submucosal glandular proliferation in older adults with NP compared to Young ones with NP. Consistent with this human data, aged mice showed goblet cell hyperplasia and increased proportion of PAS-positive area in submucosal glands. Interestingly, there was remarkably increased collagen deposition in aged mice compared to young mice.

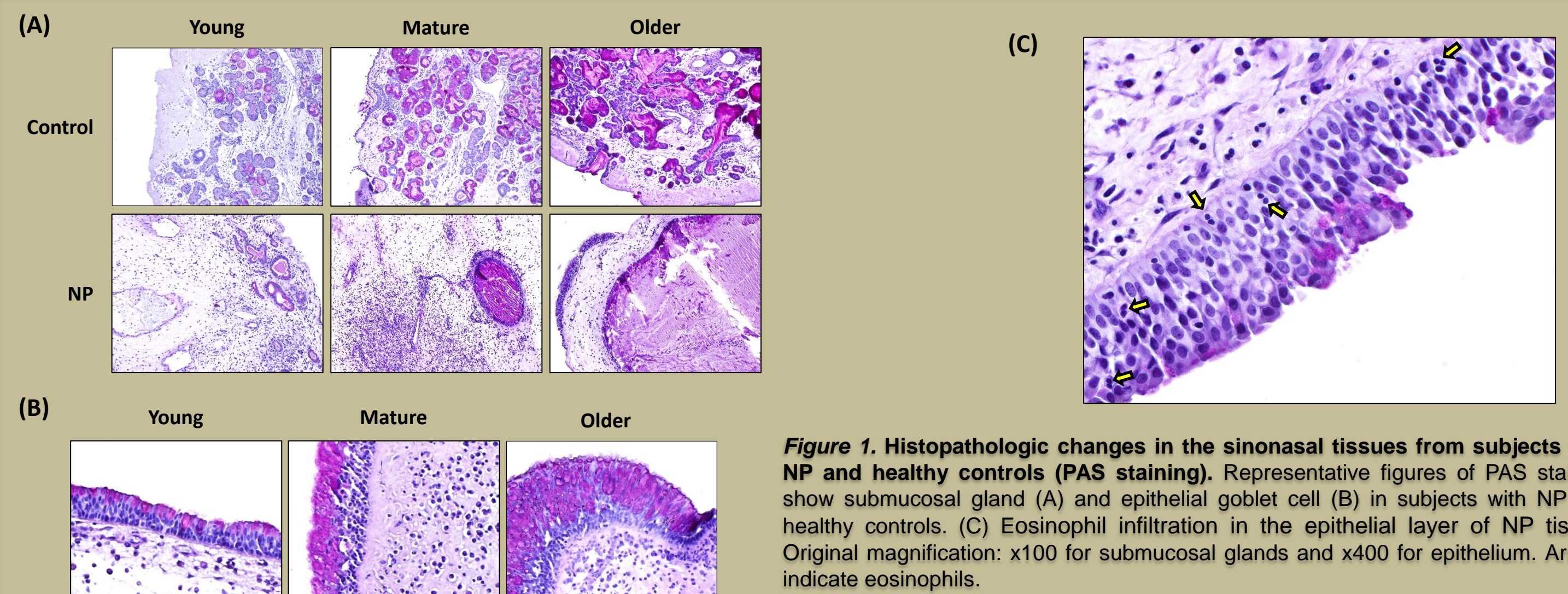


Figure 1. Histopathologic changes in the sinonasal tissues from subjects with NP and healthy controls (PAS staining). Representative figures of PAS staining show submucosal gland (A) and epithelial goblet cell (B) in subjects with NP and healthy controls. (C) Eosinophil infiltration in the epithelial layer of NP tissue. Original magnification: x100 for submucosal glands and x400 for epithelium. Arrows indicate eosinophils.

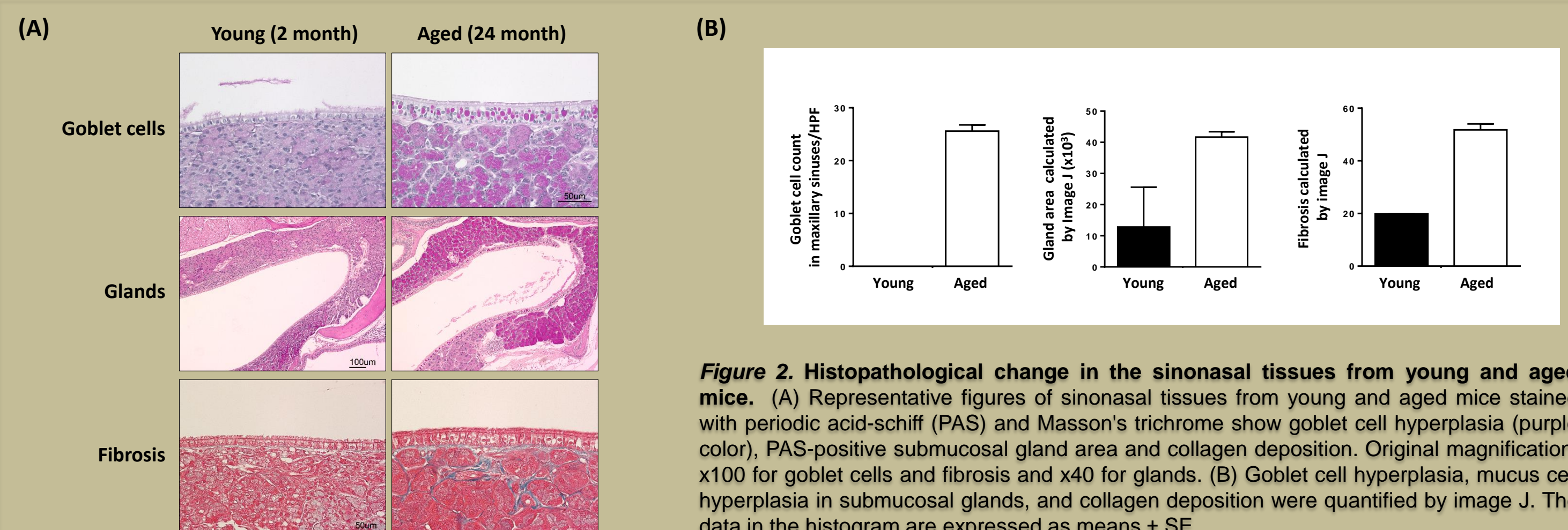


Figure 2. Histopathological change in the sinonasal tissues from young and aged mice. (A) Representative figures of sinonasal tissues from young and aged mice stained with periodic acid-schiff (PAS) and Masson's trichrome show goblet cell hyperplasia (purple color), PAS-positive submucosal gland area and collagen deposition. Original magnification: x100 for goblet cells and fibrosis and x40 for glands. (B) Goblet cell hyperplasia, mucus cell hyperplasia in submucosal glands, and collagen deposition were quantified by image J. The data in the histogram are expressed as means \pm SE.

CONCLUSION

Significant histological differences in subjects with NP and healthy controls exist among different age groups. These age-related histological changes may be related to higher prevalence of NP in the older population. The mechanisms and functional consequences of these changes need further investigation.

Acknowledgement

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