

## 호산구형 비용과 만성염증형 비용 조직에서 5-Lipoxygenase와 Cyclooxygenase-2의 발현 : 면역조직화학적 연구

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### Expression of 5-Lipoxygenase and Cyclooxygenase-2 in Eosinophilic Polyps and Chronic Inflammatory Polyps : An Immunohistochemical Study

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#### —ABSTRACT —

**Background and Objectives** : Activation of the phospholipase A<sub>2</sub>, in response to various stimuli, release arachidonic acid, which can be further metabolized by two major enzymatic pathways : cyclooxygenase (COX) and 5-lipoxygenase (5-LOX), leading to pro-inflammatory mediators, prostanoids and leukotrienes, respectively. Histologically, polyps are divided into four types. Among them, eosinophilic and chronic inflammatory polyps are common histologic types in nasal polyps. The aim of this study was to determine the expression of COX-2 and 5-LOX in eosinophilic polyps and chronic inflammatory polyps. **Materials and Methods** : 50 nasal polyps specimens were obtained during endoscopic sinus surgery and classified into eosinophilic and chronic inflammatory polyps. 11 normal nasal mucosa were taken from the inferior turbinate of patients who underwent septoplasty operation. The 5-LOX and COX-2 protein expression were determined by immunohistochemical staining. **Results** : The expression of 5-LOX and COX-2 protein were detected in nasal polyps and normal nasal mucosal tissues. 5-LOX was predominantly expressed in cytoplasm and nucleus of inflammatory cells and also found in submucosal glandular cells, smooth muscle cells of vascular walls, and surface epithelial cells. COX-2 was strongly expressed in cytoplasm of inflammatory cells and also found in submucosal glandular cells, smooth muscle cells of vascular walls, and surface epithelial cells. The expression of COX-2 and 5-LOX were significantly increased in eosinophilic polyps compared with chronic inflammatory polyps and normal inferior turbinate. **Conclusions** : Both COX-2 and 5-LOX are important to develop nasal polyps. Difference between the two groups may reflect difference in disease severity or in the nature of the inflammatory process. (J Clinical Otolaryngol 2005;16:105-110)

**KEY WORDS** : Nasal polyps · Cyclooxygenase-2 · 5-Lipoxygenase.

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서 론

COX - 2 5 - LOX

COX - 2 5 - LOX

대상 및 방법

대 상

Multiple allergen stimulation test(MAST)

Hematoxylin and eosin stain Hel-

Iquist

20

30

1

cyclooxygenase(COX)

5 - lipoxygenase(5 - LOX)

prostanoids leukotrienes(LTs)

<sup>2)</sup> Prostanoids

, Prostaglandin(PG) E<sub>2</sub> PG I<sub>2</sub>

histamine bradykinin

가

가

가

가

11

PG E<sub>2</sub>

<sup>3)</sup>

13~65

Cysteinyl LTs(Cys-

35

36

14

LTs) LT D4

가,

23~56

33

가,

Tissue Microarray 제조 및 면역조직화학염색 (immunohistochemistry)

PBS 10

formalin

가

24

Manual Tissue Arrayer

MTA - 1(Beecher Instruments, Sun Prairie, WI, USA)

tissue microarray

0.6 mm 2~3

<sup>5)</sup> Davidsson Hellquist<sup>6)</sup>

95

82 가 , 7 가

496 371 가

, 7)

, 125 가

, Chmi-

elik <sup>8)</sup>

95% 가

5 μm

organic silane

가

10 mM citrate buffer(pH 6.0)

5-Lipoxygenase Cyclooxygenase-2

통계학적 처리

SAS(release 8.1)

Wilcoxon rank sum test

±

p 0.05

결 과

COX-2와 5-LOX의 면역조직화학검사

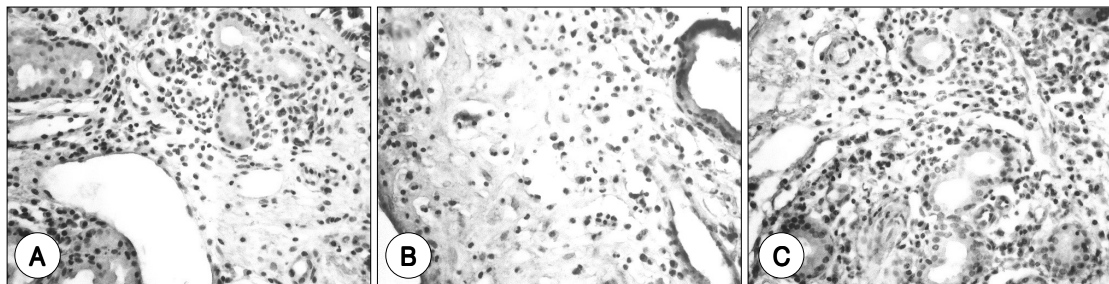
5-LOX

(Fig. 1), COX-2

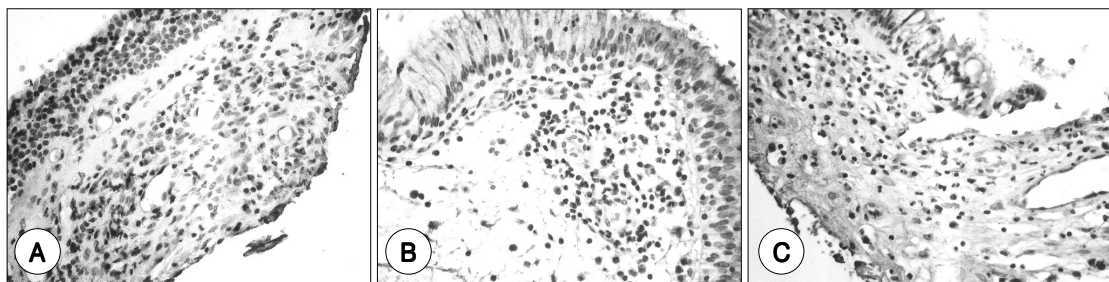
(Fig. 2). 5-

LOX COX-2

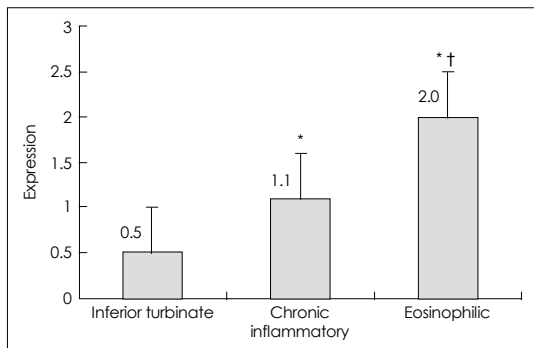
COX-2(Fig. 3) 5-LOX(Fig. 4)



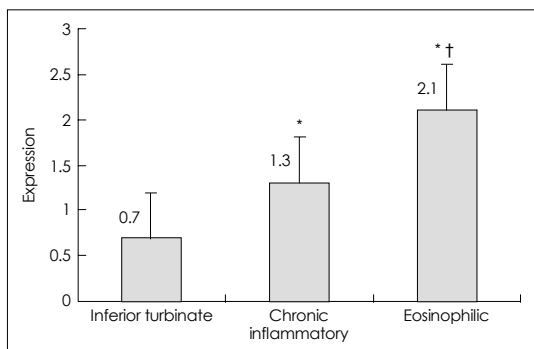
**Fig. 1.** Immunohistochemical stain of COX-2 on inferior turbinate (A), eosinophilic nasal polyp (B), and chronic inflammatory nasal polyp (C). COX-2 staining was strongly and diffusely expressed in cytoplasm of inflammatory cells, submucosal glandular cells, smooth muscle cells of vascular walls and surface epithelial cells (×400). COX-2 : Cyclooxygenase-2.



**Fig. 2.** Immunohistochemical stain of 5-LOX on inferior turbinate (A), eosinophilic nasal polyp (B), and chronic inflammatory nasal polyp (C). 5-LOX staining was predominantly expressed in cytoplasm and nucleus of inflammatory cells, submucosal glandular cells, smooth muscle cells of vascular walls and surface epithelial cells (×400). 5-LOX : 5-Lipoxygenase.



**Fig. 3.** The comparison of expression of Cyclooxygenase-2 : The mean expression score of Cyclooxygenase-2 was significantly elevated in eosinophilic polyps and chronic inflammatory polyps compared with normal inferior turbinate (\* :  $p < 0.0001$ ), and significantly higher in eosinophilic polyps than chronic inflammatory polyps († :  $p < 0.0001$ ).



**Fig. 4.** The comparison of expression of 5-Lipoxygenase : The mean expression score of 5-Lipoxygenase was significantly elevated in eosinophilic polyps and chronic inflammatory polyps compared with normal inferior turbinate (\* :  $p < 0.0001$ ), and significantly higher in eosinophilic polyps than chronic inflammatory polyps († :  $p < 0.0001$ ).

가 (p<0.0001),  
(p<0.0001).

**고 찰**

가  
1) COX  
prostanoids  
1 COX -  
COX - 2  
9)10) Demoly 11) COX - 1  
COX - 2  
COX - 1 COX - 2  
가  
12) COX - 2  
가  
Mul-  
13) COX - 1 COX - 2  
loil  
, prostanoid  
가  
COX - 1 COX - 2  
, Liu 14)  
COX - 2가  
IL - 6  
COX - 2  
COX - 2가  
5 - LOX LTA<sub>4</sub>  
LTA<sub>4</sub>  
LTA<sub>4</sub> epoxide hydrolase LTC<sub>4</sub> syn-  
thase  
, LTA<sub>4</sub> epo-  
xide hydrolase CysLTs  
5 - LOX LTs  
15) LTs

16 - 19)

Arango  
5 - LOX  
5 - LOX가  
Arango  
LTs  
Arango  
COX - 2  
5 - LOX  
5 - LOX  
5 - LOX  
가  
중심 단어 : Cyclooxygenase - 2 · 5 - Lipoxyge-  
nase.

5 - Lipoxygenase Cyclooxygenase - 2

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