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Significance of DNA methylation to polyp formation of eosinophil and neutrophil in chronic rhinosinusitis

Jong-Yeup Kim[1], **Min-Ji Cha**[1] and **Dong-Kyu Kim**[2]
[1]Konyang University, South Korea
[2]Hallym University, South Korea

Predicting which patients are at a higher risk for recurrent chronic rhinosinusitis with nasal polyps (CRSwNP) is one of the most challenging problems in clinical rhinology. A direct association between nasal polyp and eosinophil/neutrophil counts was reported. This study aimed to identify difference of eosinophils and neutrophils for formation of polyp by DNA methylation in CRS. We have previously shown that KRT 19, NR2F2, ADAMTS1, and ZNF222 levels are changed in nasal polyps (NPs) of patients with chronic rhinosinusitis (CRS) in patients. A study was performed from 30 patients with CRS with bilateral NP, examining the prognostic role of eosinophil and neutrophil levels. 30 patients with CRS were classified by the rate of eosinophils and neutrophils in tissue. The methylated genes detected by DNA methylation microarray were validated by methylation-specific polymerase chain reaction (PCR), bisulfite sequencing, and real-time PCR. DNA methylation microarray identified 43,674 CpG islands in 518 genes. Specific genes were found to have a hypermethylated signal, and some genes were significantly hypomethylated in the promoter region in eosinophils compared with neutrophils. Real-time PCR showed that the expression levels of genes were changed in eosinophils, when compared with neutrophils. We clearly demonstrated that the two subgroups of CRSwNP had characteristic differences in DNA methylation, which allows for pathophysiologically meaningful differentiations with likely therapeutic consequences. Further studies are needed to confirm the significance of these epigenetic factors in the mechanisms underlying NP formation.

Biography

Jong-Yeup Kim has his expertise in improving the Otorhinolaryngology (snoring, septic disease, sinusitis, tonsillitis, nasal molding and allergic rhinitis). His open and contextual evaluation model based on responsive constructivists creates new pathways for improving nose disease. He has built this model after many years of experience in research, evaluation, teaching and administration both in hospital and education institutions.

k@kyuh.ac.kr

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