steady tendency of BE cilia beating frequency decrease (by 13, 15 и 17%, respectively). By the 4th minute the beating frequency was 5.33±1.29 Hz.

Conclusion: The motion activity of BE cilia is significantly decreased under the influence of hyposmolar stimulus.

AP217

EFFECTS OF DIESEL EXHAUST PARTICLE IN HUMAN BRONCHIAL EPITHELIAL CELL MIGRATION AND THE INTRACELLULAR SIGNALING PATHWAY

YING-JI LI[1], MAIKO KOBAYASHI[1], TAKAKO SHIMIZU[1], YUKIYO HIRATA[1], HIROFUMI INAGAKI[1], ARATA AZUMA[2], HAJIME TAKIZAWA[3], TOMOYUKI KAWADA[1]

[1]Department of Hygiene and Public Health, Nippon Medical School, Tokyo, Japan, [2]Department of Pulmonary Medicine/Infection and Oncology, Nippon Medical School, Tokyo, Japan, and [3]Department of Respiratory Medicine, Kyorin University Hospital, Tokyo, Japan

Background and Aims: Diesel exhaust particle (DEP) is the major components of PM2.5. Many studies of molecular mechanisms have focused on the role of reactive oxygen species (ROS) generated directly and indirectly by exposure to DEP. We have confirmed that DEP was involved with induction of epithelial-mesenchymal transition (EMT) process in human bronchial epithelial cell (HBEC) by oxidative stress. The current study was designed to elucidate the effect of DEP and the intracellular signaling pathway of DEP in the cell migration on HBEC.

Methods: We used human bronchial epithelial cell line BET-1A. The cells were plated into 24-well plates in the culture medium (LHC-9). When 90% confluent, in the first experiment, DEP (Standard Reference Material 2975) was treated culture cells with various concentrations for 24hs; in the second experiment, DEP was treated with 25μg/ml and Gi Protein inhibitor (pertussis toxin solution, PT) or ROCK inhibitor (Y-27632) treated with various concentrations for 24hs. The cell layers were "wounded" using a pipette tip. Cultures were then incubated in basal medium (LHC-D) with 30% LHC-9 for 24hs, after which the cell layers were fixed and stained with May-Gimza. Photomicrographs were taken and then examined cells migration in each group.

Results: The cells migration was up-regulated by DEP exposure. The stimulation of cells migration by DEP exposure was blocked by PT treatment, however, no effect of Y27632 was observed.

Conclusions: Our results suggest that DEP might be involved with induction of EMT process in human bronchial epithelial cells, and the stimulation of EMT cells migration by DEP might be mediated by GTP-binding protein signaling pathway.

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AP218

DESTRUCTIVE-CYTOLYTIC ACTIVITY OF BRONCHIAL EPITHELIUM AND ITS INFLUENCE ON THE DEVELOPMENT OF COLD AIRWAY HYPERRESPONSIVENESS IN PATIENTS WITH ASTHMA

ALEKSEY B PIROGOV[1], SERGEY V ZINOV'EV[2], **JULIY PERELMAN**[1], ANNA G PRIKHODKO[1], VICTOR P KOLOSOV[1]

[1]Far Eastern Scientific Center of Physiology and Pathology of Respiration, Blagoveshchensk, Russian Federation, and [2]Amur State Medical Academy, Blagoveshchensk, Russian Federation

Background and Aim: The destruction of airway epithelium under the influence of effectors of inflammation in asthmatics with cold airway hyperresponsiveness (CAHR) has not been studied yet. The aim was to study destructive and cytolytic activity of cells of bronchial epithelium in asthmatics in correlation with structural-functional profile of granulocytic segment of bronchial inflammation and to assess its influence on the development of CAHR.

Methods: FEV_1, airway response (ΔFEV_1) to 3-minute ultrasound inhalation with distilled water (IDW), the contents of myeloperoxidase (MPO, pixels) in the induced sputum (IS), the level of MPO (ng/ml), neutrophilic elastase (NE, ng/ml) and α1-antitrypsin (AAT, mg/dl) in the blood serum before and after IDW were studied in 36 patients with asthma (mean age 40.6±1.6 years old).

Results: According to the results of cytological study, 11 patients with low contents of neutrophils in IS (11.5±1.2%) were included in the 1st group, 25 patients with high contents of neutrophils (37.5±3.9%, p=0.0001) in the 2nd group. The level of asthma control was lower in the 2nd group than in the 1st group (17.1±0.98 vs. 20.0±1.0 points of ACT, p=0.05), FEV_1 was lower (89.6±2.8 vs. 100.2±3.9%, p=0.04), and the response to IDW was more intensive (ΔFEV_1 -6.5±1.5% vs. -1.8±1.9%, p=0.049). In response to IDW the patients of the 2nd group had a decrease of MPO from 267.5±48.4 till 159.9±32.8 (p=0.003), of NE from 411.1±71.8 till 223.1±41.5 (p=0.004), of AAT from 227.8±9.7 till 205.1±12.1 (p=0.042), whereas in the 1st group the values of MPO (170.4±50.3 vs. 164.0±59.6), NE (258.9±86.5 vs. 208.4±70.3) and AAT (213.8±11.4 vs. 211.5±14.5) did not change significantly.

Conclusion: Activation of neutrophilic component of bronchial inflammation in patients with asthma leads to worsening of the lung function and is concomitant with the decrease of the system level of peroxidase, protease and antiproteolytic activity in response to IDW.

AP219

THE ASSESSMENT OF DIFFERENCE LEVEL OF TISSUE INHIBITOR OF METALLOPROTEINASE (TIMP)-1 FROM PERIODONTAL FLUID AMONG SMOKERS

MULKAN AZHARY[1,2], MUHAMMAD AMIN[3], SOETJIPTO SOETJIPTO[3], MULYADI MULYADI[1], SUNNATI SUNNATI[4]

[1]Faculty of Medicine-Syiah Kuala University, Banda Aceh, Indonesia, [2]Faculty of Medicine-University of Indonesia, Jakarta, Indonesia, [3]Faculty of Medicine-Airlangga University, Surabaya, Indonesia, and [4]Faculty of Dentistry-Syiah Kuala University, Banda Aceh, Indonesia

Background and Aim: The periodontium is vulnerably exposed during smoking leading to the extracellular matrix (ECM) destruction due to active activity of proteases. Lowly balanced level of TIMP-1 induces the progression of tissue destruction. This study aimed to assess the difference level of TIMP-1 from gingival crevicular fluid (GCF) in order to evaluate the presumed ECM destruction among smokers, especially ex smokers suffering from COPD.

Methods: The study included 30 male smokers, of whom 15 were ex smokers suffering from COPD. They underwent the physical examination and spirometry. The criteria of COPD based on post bronchodilator FEV1/FVC < 70% with FEV1% predicted <50 %. Then, the gingival crevicular fluid (GCF) was absorbed by inserting a small piece of filter paper into the gingival sulci.

The measurement of TIMP-1 level from GCF used the ELISA method applying R&D system.

Results

Table 1. The characteristics of subjects

	Mean (SD)	
	Healthy Smokers	Ex Smokers (COPD)
Age (y.o.)	56,5 (3,09)	59,5 (5,58)
Number of subjects	15	15
Pack year	34,5 (5,26)	33,4 (6,47)
FEV1/FVC (%)	81,9 (6,67)	44,7 (7,36)
FEV1% predicted (%)	79,9 (11,89)	34,3 (6,38)
TIMP-1 (ng/ml)	24,1 (4,25)	20,9 (5,27)

Table 2. The difference of TIMP-1 level from GCF

	Subjects	Mean (SD)	*p* value
TIMP-1 (ng/ml)	Healthy Smokers	24,1 (4,25)	>0.05
	Ex Smokers (COPD)	20,9 (5,27)	

Conclusion: The level of TIMP-1 was elevated among healthy smokers balancing the increase of protease which is naturally essential to reduce the ECM destruction leading to progressive periodontium destruction. The higher level of TIMP-1 was correlated with the smoking pack year which was slightly higher among healthy smokers. The periodontium is more likely sensitive against the continuous smoking exposure. The emphysematous lung parenchyma is likely evaluated through the level of TIMP-1 from sputum, then compared to that from periodontium.

AP220

CADMIUM-INDUCED ER STRESS AND INFLAMMATION ARE MEDIATED THROUGH C/EBP–DDIT3 SIGNALING IN HUMAN BRONCHIAL EPITHELIAL CELLS

HYE-RYEON HEO[1,2], JEEYOUNG KIM[1,2], WOO JIN KIM[1,2], **SEOK-HO HONG[1,2]**

[1]Department of Internal Medicine, School of Medicine, Kangwon National University, Chuncheon, South Korea, and [2]Environmental Health Center, Kangwon National University Hospital, Chuncheon, South Korea

Background and Aims: Cadmium (Cd), a major component of cigarette smoke, disrupts the normal functions of airway cells and can lead to the development of various pulmonary diseases such as chronic obstructive pulmonary disease (COPD). However, the molecular mechanisms involved in Cd-induced pulmonary diseases are poorly understood.

Methods: We identified a cluster of genes that are altered in response to Cd exposure in human bronchial epithelial cells (BEAS-2B) and demonstrated that Cd-induced ER stress and inflammation are mediated via CCAAT-enhancer-binding proteins (C/EBP)-DNA-damaged-inducible transcript 3 (DDIT3) signaling in BEAS-2B cells.

Results: Cd treatment led to marked upregulation and downregulation of genes associated with the cell cycle, apoptosis, oxidative stress and inflammation as well as various signal transduction pathways. Gene set enrichment analysis revealed that Cd treatment stimulated the C/EBP signaling pathway and induced transcriptional activation of its downstream target genes, including DDIT3. Suppression of DDIT3 expression using specific small interfering RNA effectively alleviated Cd-induced ER stress and inflammatory responses in both BEAS-2B and normal primary normal human bronchial epithelial cells.

Conclusions: Ultimately, these data suggest that C/EBP signaling may have a pivotal role in the early induction of ER stress and inflammatory responses by Cd exposure and could be a molecular target for Cd-induced pulmonary disease.

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AP221

ANTI-INFLAMMATORY AND ANTI-APOPTOTIC EFFECTS OF POLYDEXYRIBONUCLEOTIDE ON ACUTE LUNG INJURY (LIPOPOLYSACCHARIDE-INDUCED ACUTE LUNG INJURY IN RATS)

CHEON WOONG CHOI[1], JAE JOON HWANG[1]

[1]Department of pulmonology and critical care medicine, Kyung Hee university hospital at Gang-Dong, Seoul, South Korea

Background and Aims: Acute lung injury (ALI) is an inflammatory response of the lung to various causes. Beside inflammation, apoptosis is related to tissue damage in ALI mechanism. PDNR is a compound extracted from spermatozoa of salmon. PDRN has showed both anti-inflammatory and anti-apoptotic effects. This study was conducted to confirm the possibility of PDRN as a therapeutic agent in acute lung injury.

Methods: 36 male SD rats were classified into control group, ALI group, and ALI+PDRN treatment group. ALI was induced by intra-tracheal Lipopolysaccharide administration. The PDRN was injected into the abdominal cavity once at a concentration of 8 mg/kg, 1 hour after LPS administration.

Results: Compared with the control group, in lung tissue, inflammatory makers in ALI group were significant higher in lung tissue (TNF-a (1.00 ± 0.00 vs. 1.52 ± 0.08; P=0.001) and IL-6 (3h: 1.00 ± 0.00 vs. 1.60 ± 0.14; P=0.003)), and in the BALF (TNF-α (3h: 30.69 ± 3.07 vs. 3326.31 ± 162.06 pg/mL; P=0.000) and IL-6 (3h: 35.37 ± 3.54 vs. 2495.50 ± 121.58 pg/mL; P=0.000)). Between ALI group and ALI +PDRN treated group, ALI + PDRN treated group showed significant inflammation lowering effect in lung tissue (TNF-α(1.52 ± 0.08 vs. 1.01 ± 0.03) and IL-6 (1.60 ± 0.12 vs. 0.55 ± 0.02), all P<0.05) and in BALF(TNF-α(3326.31 ± 162.06 pg/mL vs. 2112.16 ± 265.92 pg/mL), IL-6(2495.50 ± 121.58 pg/mL vs. 1545.23 ± 194.54 pg/mL)and improving pathologic change(Lung injury score ALI 1.62±0.18, ALI-PDRN 1.5±0.16 p<0.02). Percentile of TUNEL positive cells and caspase-3 positive cells were also lower in ALI + PDRN treated group than ALI group.

Conclusions: The protective effect of PDRN on ALI may be associated with suppression of both apoptosis and inflammatory responses. Thus, it can be suggested that PDRN might be a potential therapeutic agent for ALI.

AP222

SPIRODELA POLYRHIZA EXTRACT AND ITS CONSTITUENTS CAN MODULATE UPPER AIRWAY SECRETION VIA CALCIUM ACTIVATED CL- CHANNEL ANO1

WOO KYUNG KIM[1,3], JOO HYUN NAM[2,3], YU RAN NAM[2,3]

[1]Department of Internal Medicine Graduate School of Medicine, Dongguk University, Goyang, South Korea, [2]Department of Physiology, Dongguk University College of Medicine, Gyeongju, South Korea, and [3]Channelopathy Research Center (CRC), Dongguk University College of Medicine, Goyang, South korea