Result Two hundred and two patient completed the OAS and were evaluated by specialists. A cut-off of >10.5 , points in the OAS yielded sensitivity of 0.79; specificity of 0.78; VP (+) 0.22 and VP (-) 0.98. The detected prevalence of OA was 8.2% and asthma exacerbated by work was 14.2%, for a total prevalence of work-related asthma of 22%.

Discussion The findings support implementation of an occupational asthma surveillance program in the PHC network in Santiago, Chile to benefit workers and to improve the results of PHC respiratory health programs.

1059

THE ROLE AND MECHANISM OF EMT IN MARCO-MEDIATED SILICOSIS IN RATS

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10.1136/oemed-2018-ICOHabstracts.1240

Objectives The animal model of silicosis of non-exposed tracheal instillation induced by SiO₂ in rats lung fibrosis were studied. To investigate:

1. whether SiO₂ can induce fibrosis in lung tissue by induction of epithelial interstitial transformation (EMT);
2. EMT in poly guanine nucleotide (PolyG) molecular biology mechanism of silicosis fibrosis reversal.
3. the effects of PolyG preventive and therapeutic interventions on EMT in rats exposed to silica dust and the effect of intervention at different time points.

Methods Ninety-six healthy male Sprague-Dawley (SD) rats weighing 180–220 g were randomly divided into normal saline group (n=32), silicosis model group (n=32), PolyG prevention group (n=16) and PolyG (28 days) treatment group (n=16). After the rats were anaesthetised with ether, the control group was injected with 1 ml normal saline by bronchial instillation. The rats in other groups were treated with non-exposed tracheal infusion of a one-time infusion of 50 ml/L silica suspension 1 ml. The rats in the PolyG preventive group were treated with PolyG 2.5 mg/kg body weight (the weight of each rat was determined 28 days after modelling) at the same time by tail vein injection. The rats in the PolyG treatment group were treated with intravenous injection of PolyG 2.5 mg/Kg body weight (by modelling 28 days after each rat weight to determine the appropriate dose). The rats in the polyG prevention group and the treatment group were sacrificed on the 28th day and the 56th day after the corresponding administration. Silicosis model group and saline control group also have 8 rats were sacrificed at the same time point. (Macrophage receptor with collagenous structure, MARCO), E-cadherin (E-cadherin) were detected by Western blotting. The macrophage receptor (MARCO) Cadherin, E-cadherin, α -smooth muscle actin (α -SMA), vimentin and type I and type III collagen; the right amount of lung tissue, The relative expression levels of E-cadherin, α -SMA, vimentin and type I and type III procollagen mRNA were detected by Real-time PCR. The right middle lobe tissue was fixed with 4% paraformaldehyde, paraffin section, the histopathological changes of lung tissue were observed by HE staining and Masson staining. Immunohistochemical staining was used to detect the localization and expression of E-cadherin, α -SMA and vimentin in lung tissue.

Results

1. Histopathological changes of lung tissue in different groups:

The lung tissue structure of the rats in the control group was normal, and the infiltration of inflammatory cells was observed in the surrounding area, and the lung tissue structure of the control group did not change significantly over time; There were a large number of inflammatory cell infiltration in the lung tissue of the rats in the silicosis model, and the typical fibrous nodules were formed. The nodules were composed of macrophages and fibroblasts. Some areas of the alveolar structure still existed, showing different alveolar walls and small blood vessel wall thickening; with the dying time, the number of fibrous silicon nodules increased, some of the silicon nodules have a trend of integration and becoming bigger, in particular, is completely fibrous tissue, or even fibrotic changes; In PolyG prevention group and treatment group, the number of cell nodules or silicon nodules was lower than that of the model group; the degree of lesion in the rats was significantly lower than that in the control group. The results of immunohistochemistry showed that α -SMA and vimentin positive cells were significantly increased in the silicosis model group, and the number of E-cadherin positive cells was significantly decreased. After administration of PolyG, the number of E-cadherin-positive cells and the number of α -SMA and vimentin-positive cells were significantly increased.

2. The expression of MARCO, E-cadherin, α -SMA and vimentin in the lung tissue of the control group were not significantly different ($p<0.05$). There was no significant difference in the expression of MARCO and EMT-related proteins in rat lung tissue at different time points ($p<0.05$). The levels of E-cadherin in the lung tissue of the silicosis model group were increased with the prolongation of observation time ($p<0.05$). The expression levels of MARCO, α -SMA and vimentin protein in the lung tissue of the PolyG intervention group (prophylactic and therapeutic) were lower than those in the control group, but the E-cadherin was higher than that of the silicosis group model group ($p<0.05$).
3. The comparison of mRNA expression levels of E-cadherin, α -SMA and vimentin in lung tissue of different groups: the expression of E-cadherin, α -SMA and vimentin mRNA in lung tissue of all groups were the same as those of corresponding protein.
4. The expression of collagen I and III in the lung tissue of different groups were significantly higher than those in the control group ($p<0.05$). There was no significant difference in the expression of collagen I and III in rat lung tissue of control groups at different time points ($p<0.05$). The expression level of collagen I and III in the lung tissue of silicosis model group increased with the prolongation of dying time ($p<0.05$). The protein content of collagen I and III in PolyG intervention group was significantly higher than that in the control group ($p<0.05$). The mRNA expression of type I and III procollagen were the same as that of I and III collagen.

Conclusions

- The protein content and mRNA expression of E-cadherin were decreased, while α -SMA and vimentin in silicosis model group were increased, which indicated that there was epithelial-mesenchymal transition in the development of silicosis.
- After inhibition of MARCO combined with SiO₂, the protein content and mRNA expression of α -SMA and vimentin were

significantly down-regulated, and the protein content and mRNA expression of E-cadherin were significantly up-regulated; I, III collagen content and I, III type procollagen mRNA expression levels were decreased and lung tissue pathological changes were reduced in vary degrees.

- PolyG intervention (prophylactic and therapeutic) can effectively inhibit the progression of EMT, and further delay the formation of pulmonary fibrosis, and the effect of early to give preventive intervention is better.

1060

ROLE OF ENDOPLASMIC RETICULUM STRESS IN THE INTERVENTION EFFECT OF POLYG TO SILICOTIC FIBROSIS IN RATS

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10.1136/oemed-2018-ICOHabstracts.1241

Background Silicosis is a kind of serious occupational disease caused by inhalation of silicon dioxide dust in the professional activities for a long term, and its basic pathological features mainly include pulmonary inflammation and diffuse fibrosis. Scholars have poured much energy into research and put forward a variety of hypotheses about the mechanism of silicotic fibrosis, and the apoptosis of lung cells is considered as one of the most important mechanism of silicosis fibrosis. Endoplasmic reticulum stress is one of the important signal pathways mediating cell apoptosis, and it has been proved to be associated with many diseases. But there is still little knowledge about the relationship between endoplasmic reticulum stress and silicotic fibrosis. Our previous study found that PolyG has preventive and therapeutic effect on pulmonary fibrosis in rats, however the mechanism about the intervention effect of PolyG on silicotic fibrosis is still unclear.

Objective To investigate the role and the mechanism of endoplasmic reticulum stress in the intervention effect of polyuridylic acid (PolyG) on silicotic fibrosis in rats.

Methods Eighty SD rats were randomly divided into saline group, silicosis model group, PolyG prevention group and PolyG treatment group, building the animal model of silicosis with non exposed tracheal method except saline group. Rats in prevention group were given PolyG on the day after dusts and were sacrificed at 28 d and 56 d time point after given PolyG, 8 rats were sacrificed in each group. Rats in treatment group were given PolyG at 28 d after dusts and were sacrificed at 28 d and 56 d time point after given PolyG, 8 rats were sacrificed in each group. At 28 d, 56 d and 84 d time point after dusts, rats in saline group and silicosis model group were sacrificed (8 rats were sacrificed in each group) as the negative and positive groups at the same time. The pathological changes of lung tissue was observe by hematoxylin eosin staining and Masson staining, detect the expression level of endoplasmic reticulum stress and apoptosis related proteins IRE1, GRP78, CHOP, PERK, ATF6, casepase3 and casepase12 in lung tissue by Western blot.

Results In saline groups, the structure of lung tissue was normal, some showed mild inflammation and there is no silicotic nodule and collagen deposition, the lung tissue in silicosis model groups showed the alveolar structure were severely destructed, and it occurred a lot of silicotic nodules and collagen deposition, most lung tissue in this groups have typical

fibrous nodules, and along with the extension of exposure, the nodules gradually fused and formed clumps. But the silicotic nodules and collagen deposition in PolyG prevention group and PolyG treatment group were markedly reduced, most of the nodules disappeared, just showed the inflammation in the lung tissue. At 28 d and 56 d time point after prophylactic use polyG, the expression level of IRE1, GRP78, CHOP, PERK, ATF6, casepase3 and casepase12 in prevention group were lower than the same period of silicosis model group ($p < 0.05$), compared with 28 d PolyG prevention group, the expression level of each protein was decreased in 56 d PolyG prevention group, but it has no statistical significance ($P > 0.05$). 3. At 28 d and 56 d time point after Therapeutic use polyG, the expression level of IRE1, GRP78, CHOP, casepase3 and casepase12 in treatment group were lower than the same period of silicosis model group ($p < 0.05$), compared with 28 d PolyG treatment group, the expression level of each protein was decreased in 56 d PolyG treatment group, but it has no statistical significance ($P > 0.05$). 4. The expression level of each protein in PolyG prevention group were lower than the PolyG treatment group, the expression level of GRP78, PERK, ATF6, casepase12 and casepase3 was significantly different between PolyG prevention group and PolyG treatment group ($p < 0.05$), the different expression level of IRE1 and CHOP in this comparison closed significant level ($p = 0.056$, $p = 0.055$).

Conclusion The endoplasmic reticulum stress participate in the mechanism of the intervention effect of PolyG to silicosis fibrosis in rats, PolyG can be effective in the prevention and treatment of silicosis fibrosis, and we will get more significant effect by preventative using PolyG, both the short-term and long-term intervention effect of PolyG on silicotic fibrosis are well.

1098

A POPULATION BASED LONGITUDINAL STUDY OF RISK FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND OCCUPATIONAL EXPOSURE TO ORGANIC AND INORGANIC DUST

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10.1136/oemed-2018-ICOHabstracts.1242

Introduction The development of chronic obstructive pulmonary disease (COPD) has previously been linked to occupational exposure. The aim of this register-based study was to assess the risk for being diagnosed with COPD in subjects with occupational exposure to organic and inorganic dust.

Methods The study population included 20 069 men and 23 572 women from the Stockholm Public Health Cohort. Information of occupation was derived from 1985 or 1990 censuses. New cases of COPD were identified for the period 1990–2010. COPD cases were defined as either a self-reported COPD diagnosis by a physician or a prescription for anticholinergic drugs. A quantitative job-exposure matrix provided information on organic dust (wood dust, paper dust, textile dust, oil mist, cooking fumes, other organic dust) and inorganic dust (respirable crystalline silica dust, iron dust, other inorganic dust and fibres). Analyses were adjusted for age and smoking.