

## Studies on Regional Pulmonary Function in Bronchial Asthma (6th Report)

### —Study on Pathophysiology in Bronchial Asthma—

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The regional pulmonary function in asthmatic attack and nonattack was investigated by radioisotope pulmography and pulmonary scintigraphy using radioisotope ( $^{133}\text{Xe}$ ,  $^{131}\text{IMAA}$ ). The results above mentioned were compared with the findings of selective bronchogram and selective pulmonary angiogram. The experimental asthma in dogs inhaled histamine as almost same numbers of clinical cases were studied.

The following results were obtained.

1) In asthmatic attack, regional disturbances in 90% wash out time in wash out phase, ventilation index,  $\text{RVr}/\text{TLCr}$  ratio and perfusion index were calculated on the pulmogram.

The grades of these regional disturbances caused variations in each area of lung field. It was recognized that was so-called disturbances of regional pulmonary function.

Most cases of these disturbances of regional pulmonary function were improved with the abatement of attack, that is, these findings show reversibility.

2) The regional disturbances in the pulmogram

was comparatively closely related to the regional disturbances in pulmonary scintigram and in some findings, the depreciation of regional blood flow and ventilative function were correlated but the abnormality of pulmonary arterial blood flow in asthmatic attack were seen in some cases with not only the depreciation of regional pulmonary blood flow, but also the increase of regional pulmonary blood flow and pulmonary blood volume.

3) In the findings of selective bronchogram and pulmonary angiogram in asthmatic attack, the constriction (stenosis), interruption and expansion of bronchial tree and pulmonary arteries were showed both in clinical cases and the model of asthma in dogs, and also the unevenness of pulmonary capillaries were seen clearly.

It was found that the disturbances of regional pulmonary function was closely related to the regional changes on selective bronchogram and selective pulmonary angiogram.