



<b>Title</b>	<b>Ciliary assessment in bronchiectasis: is there a clinico-pathological correlation?</b>
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### CILIARY ASSESSMENT IN BRONCHIECTASIS: IS THERE A CLINICO-PATHOLOGICAL CORRELATION?

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Bronchiectasis is a common and usually idiopathic condition in Hong Kong and affected patients suffer from regular sputum production and recurrent exacerbations. A proportion of these patients have ciliary structural or functional abnormalities and are likely to run a deteriorating course. Assessment of ciliary function might allow early recognition of these patients who may benefit from more intensive treatment. We have therefore performed this cross sectional clinico-pathological study on Chinese patients with bronchiectasis. Respiratory mucosa was obtained from the inferior turbinate of 100 Chinese bronchiectatic (mean age $\pm$ SD, 53.8 $\pm$ 18.78 years) and 45 normal subjects and assessed for speed and coordination of beating with a phase contrast microscope and a photometric system linked to a digital converter. Transmission electron microscopy was also used to examine the ultrastructure of respiratory cilia. The mean ciliary beat frequency in bronchiectatic patients (11.1 $\pm$ 3.15Hz) was significantly lower than normal subjects (13.8 $\pm$ 1.49Hz,  $p < 0.0001$ ). Transmission electron microscopy revealed that bronchiectatic subjects ( $n=61$ ) displayed very frequent ultrastructural abnormalities (73.8% of cases): presence of compound cilia ( $n=26$ ), single ( $n=18$ ) or extra- microtubule ( $n=11$ ), matrix abnormalities ( $n=1$ ), dynein arm deficiency ( $n=3$ ), and abnormal ciliary membrane ( $n=2$ ). There was no significant difference between the ciliary beat frequency of patients with and without ciliary ultrastructure ( $p > 0.05$ ). We report the preliminary results of the first systematic ciliary assessment study in bronchiectasis and the results suggest that Oriental patients with bronchiectasis have very frequent ciliary ultrastructural abnormalities. These findings are undoubtedly of major significance in the elucidation of the aetiological mechanism in this largely "idiopathic" condition.

### THE RELATIONSHIP BETWEEN SPUTUM MICROBIAL LOAD AND INFLAMMATORY INDICES IN BRONCHICTASIS

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There are distinct inflammatory and infective components in the pathogenesis of bronchiectasis which interact resulting in a vicious circle of events in the bronchiectatic airways. However, little is known of the correlation between these pathogenic components. Thirty patients (17F; 48.5 $\pm$ 16.5 yrs; FEV<sub>1</sub>/FVC 1.3 $\pm$ 0.6/2.1 $\pm$ 0.9) who were in steady state idiopathic bronchiectasis were recruited. 24h sputum volume, and purulence and viscosity scores were assessed for each patient. Freshly produced sputum was serially diluted and cultured quantitatively on chocolate, blood, McConkey, bactracin, mannitol, nalidixic acid and centrimide agars, and examined by using haemocytometer for leucocyte density. Sputum sol phase interleukin (IL)-1 $\beta$ , IL-8, tumor necrosis factor (TNF), and leukotriene (LT) B4 were measured using ELISA techniques. There was significant correlation between purulence score and 24h sputum volume, *Pseudomonas aeruginosa* (PA) density, IL1 $\beta$  and TNF levels, and sputum leucocyte density ( $p < 0.02$ ). Sputum viscosity score correlated significantly with 24h sputum volume and PA density ( $p < 0.04$ ). IL1 and IL8 levels correlated with sputum leucocyte density ( $p < 0.04$ ). There was, however, no correlation between the sputum leucocyte density and inflammatory mediator concentrations with sputum pathogenic, total, and commensal bacterial densities ( $p > 0.05$ ). This study provides quantitative evidence to suggest independent roles for inflammatory and infective pathogenic elements in steady state bronchiectasis. Our results are of significant clinical and therapeutic implications, and strongly suggest that infection and inflammation warrant separate treatment modalities in bronchiectasis.