Strong evidence has emerged suggesting that the level of lung function attained in early adult life is a major determinant of subsequent respiratory health. In the case of COPD, for example, the seminal findings of the ECLIPSE study\(^1\) indicate that in at least half of patients with established disease, decline in lung function is similar to that of their healthy peers. Among patients with asthma, a major determinant of subsequent persistent disease is the presence of airflow limitation at the beginning of follow up\(^2\). The factors that determine the plateau of lung function during the third decade of life are currently the focus of renewed scientific interest.

We showed for the first time that partial forced expiratory flows (PFEF) measured shortly after birth explained up to 14% of the variance of lung function at age 22 years. An even larger proportion (~25%) by PFEF measured at 6 years. There is marked tracking of lung function during the school years and thereafter\(^3\). These data suggest that genetic/congenital factors play a major role in determining maximally attained lung function\(^4\), but that deficits acquired during the preschool years are also critical.

In collaboration with colleagues in Manchester UK (MAAS cohorts) and in Sweden (BAMSE cohorts), we recently explored the role of circulating Club cell (CC16) level as a biomarker for subsequent lung function growth (Guerra et al, submitted). CC16 is a 15.8-kDa homodimeric protein and is secreted by non-ciliated bronchiolar Club cells. CC16 has been shown to have anti-inflammatory and anti-neoplastic activity in the lung\(^5\).

We found that, in the Tucson Children's Respiratory Study and in the other two cohorts, tertiles of circulating CC16 levels at age 4-6 years were positively associated with the level of lung function between ages 8 and 16 years. Moreover, in the Tucson cohort, CC16 levels at age 6 predicted lung function up to the early adult years.

Taken together, these results suggest that the protective effects of CC16 are present starting during the developing years and are independent of active smoking. Interventions that increase CC16 production or protect against alterations in CC16 producing cells could protect against deficits in lung function growth during early childhood. Such an approach could become a potential strategy for the prevention of airflow limitation for a lifetime.
Bibliography


