New benchmarks for children's lung function results

Researchers are set to rewrite the charts they use to assess children's lungs and diagnose respiratory conditions, following an extensive study of more than 2000 primary school pupils in London.

A participant performing the lung function test as part of the study.

The £1.2 million study, overseen by the UCL Institute of Child Health and funded primarily by the Wellcome Trust, has provided clear evidence of the extent to which lung capacities differ between healthy children of different ethnicities.

The Size and Lung Function in Children (SLIC) study means doctors will soon be able to interpret each child's lung function results against the most appropriate benchmarks for their ethnic background when diagnosing lung conditions and making decisions on the best treatment.

Last year the researchers tested the lung capacity of 1600 pupils aged 5–11 years from 14 London primary schools. They are now undertaking follow-up testing which will increase the total number of pupils recruited into the project to 2200 and the total number of measurements to more than 3000.

The SLIC study involved testing children who were categorised into four main ethnic groups – black, white, South Asian (Indian subcontinent) and other/mixed ethnicities.

It also took other factors into account, such as the extent to which air quality in large cities such as London may affect children's lung function.

Professor Janet Stocks, Professor of Respiratory Physiology at the Institute of Child Health, said data from the study would be used to create new 'gold standard' lung growth charts. These new charts will show the normal range of lung capacities for children of different ethnic groups based not only on their gender, age and height as in the past, but also accounting for other factors like body physique (size and shape). This will improve diagnosis of lung disease and also allow researchers to determine the effects of factors such as socioeconomic background and environmental pollution on lung health.

Professor Stocks said: 'It has been known for about 150 years that there are ethnic differences in lung function, but never before has there been a multiethnic study of this size among primary school children to establish the true impact of these differences and how we might minimize them by taking more appropriate measurements of body physique.

She added: 'The new lung growth charts that we create will enable clinicians to assess children's lungs more accurately, irrespective of ethnicity, and improve the diagnosis and treatment of conditions like sickle cell disease, asthma and cystic fibrosis.'

The new lung charts will need to be verified in other parts of the world and extended to older age groups before they can be adopted internationally, but are expected to be in regular use in Great Ormond Street Hospital's respiratory unit within 2–3 years.

Depression in patients who have a hip fracture hinders recovery and compromises immunity

Older people who suffer a hip fracture should be routinely tested and treated for depression to aid their recovery and prevent their immune systems from being compromised (Duggal et al, 2013).

As many as 40% of older people who suffer a hip fracture go on to develop depressive symptoms, but currently, they are not screened for depressive symptoms as a matter of course. At least half of people who suffer a hip fracture never regain their previous walking ability and up to a quarter may die within 1 year of the fracture, with many more developing infections and illnesses.

Researchers used the geriatric depression scale to determine whether study participants were suffering from depression – anyone who had been diagnosed with depression before their hip fracture was excluded. Thirty-eight per cent of participants were found to be suffering from depression 6 weeks after their hip fracture (averaging 8.2 on the geriatric depression scale, compared to the non-depressed group which averaged 2.6). Six months after their fracture, most of this group was found to be still depressed.

Those patients who were categorized as depressed following their fracture were less able to carry out activities of daily living when tested both 6 weeks and 6 months after the injury than patients who were not depressed. The depressed group of patients also had a slower walking speed at both the 6-week and 6-month point, taking an average of 69.6 seconds to complete a timed walking task, compared to just 52.4 seconds for the non-depressed group.

Dr Anna Phillips, Reader in Behavioural Medicine in the School of Sport and Exercise Sciences at the University of Birmingham, said: 'Although the priority for older hip fracture patients is surgery to mend the fracture, it is also very important to understand and measure the factors that affect well-being and recovery once individuals leave hospital.'

Alongside these results, the researchers discovered that depression in hip fracture patients also leads to a weaker immune system. The researchers concluded that developing depressive symptoms after a hip fracture was the main driver of immune suppression.

Dr Phillips added: 'Depression is one such factor which can affect resistance to disease and physical function as well as obviously quality of life and mental wellbeing; identifying and treating this depression is therefore key to a good recovery.'

Duggal NA, Upton J, Phillips AC, Hampson P, Lord JM (2013) Depressive symptoms are associated with reduced neutrophil function in hip fracture patients. *Brain Behav Immun* Jul 20 (Epub ahead of print)