Correspondence

Repeatability of ventilatory function measurements in a population survey of seven year old children

Sir,—The impression was given by Dr David Strachan (June 1989;44:474–9) that the coefficient of variation for FEV, in seven year old children was low, possibly even lower than that for the vital capacity. We wonder whether this could be a spurious finding. In a recent survey of 120 healthy seven year old school children, we found that 29.2% exhaled their full vital capacity within one second and that forced vital capacity (FVC) and FEV, were identical. Dr Strachan does not report a similar figure for his own group. We would suggest that the FEV, or FEV(0.75) are more useful indices of lung function than FEV, in seven year old children.

Dr Strachan’s conclusion that the peak expiratory flow (PEF) was less suitable than FEV, for repeated measurements during airway challenge in young children is again based on data which are potentially spurious. The criteria by which Dr Strachan himself chose to accept or reject the forced expiratory manoeuvre in his study subjects was the reproducibility of the FVC and FEV,. Not surprisingly, these were the two most reproducible indices. It is well known that PEF obtained by pneumotachograph may be different from that obtained by Wright peak flow meter. The two have very different within subject variability.

Unfortunately, Dr Strachan’s conclusion was not based on an examination of the reproducibility of the PEF by Wright peak flow meter, routinely used for PEF measurements in airway challenge. Our findings, based on 120 healthy seven year old school children, do not support Dr Strachan’s conclusion (table). We suggest that, because of the differences in forced expiratory technique used, PEF and FEV, (or FEV(0.75)) should be separately determined in young children.

N CHAN
M SILVERMAN
Department of Paediatrics and Neonatal Medicine
Royal Postgraduate Medical School
London W12 0NN


Relapse of pneumocystis pneumonia in the upper lobes during aerosol pentamidine prophylaxis

Sir,—Dr R M Bradburne and others (July 1989;44:591–3) report the relapse of Pneumocystis carinii pneumonia in the upper lobes during prophylaxis with pentamidine 60 mg administered every two weeks with a Respirgard II nebuliser. The authors suggest that this may be due to increased clearance of pentamidine. There is no evidence to support this hypothesis for, although DTPA transfer is increased in patients with pneumocystis pneumonia, pentamidine is retained in lung tissue for prolonged periods, and concentrations in plasma are very low after aerosol treatment. The combination of dose of pentamidine and nebuliser system used may explain the upper lobe recurrence of pneumocystis pneumonia in their patient. Using technetium-99m labelled human serum albumin as a marker for pentamidine deposition, we have shown that when the Respirgard II

AUTHOR’S REPLY

The pneumotachograph used in my study did not record any spirometric indices if the expiration lasted less than one second. Ninety nine per cent of the 892 children in the main survey were persuaded to complete baseline spirometric tests. Nevertheless, among the 635 recordings in the repeatability study, only 10 (1.6%) had equal values for FEV, and forced vital capacity (FVC). The FEV,/FVC ratio was 99% or greater in 29 (4.4%) and 95% or greater in 126 (19.8%). The ratios FEV(0.75)/FVC and FEV,/FVC were highly correlated (r = 0.89) and had similar between subject variability (SD 10% for FEV(0.75)/FVC, 9% for FEV,/FVC). In unpublished analyses of ventilatory function by medical history, socioeconomic status, housing characteristics, and salivary cotinine concentration, FEV, was generally more strongly related than FEV(0.75), although both varied in a similar direction.

I agree that peak flow and forced expiratory manoeuvres are different, and referred in the discussion to possible difficulties in extrapolating my findings to PEF recordings from a Wright meter. As I stated, however, the PEF used in the analysis was the maximum achieved, so it was independent of the choice of best curve based on reproducibility of FEV, and FVC. This may explain why the coefficient of variation (CV) for PEF in my study (70%) is substantially lower than the 14.6% quoted by Drs Chan and Silverman, and more comparable with the CV they obtained with the Wright peak flow meter. Indeed, the ratio of CV for PEF(max, Wright) to CV for FEV, in their sample (5/0.31 = 1.61) is almost identical to that for PEF(max, pneumotachograph) to FEV, in mine (7/0.43 = 1.63). The generally lower variability in their study is encouraging, but theirs was a healthy population, whereas my sample included wheezy children. If a CV as low as 5% can be achieved with Wright meters, then bronchial challenge tests using PEF would avoid excessive false positive rates. Both studies, however, suggest that FEV, is a substantially more repeatable index at this age.

DAVID STRACHAN


Coef ficients of variation for different lung function indices

<table>
<thead>
<tr>
<th>Lung function index</th>
<th>Coefficient of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV,*</td>
<td>3.1</td>
</tr>
<tr>
<td>Forced vital capacity*</td>
<td>3.6</td>
</tr>
<tr>
<td>Peak expiratory flow: Pneumotachograph*</td>
<td>14.6</td>
</tr>
<tr>
<td>Wright peak flow meter†</td>
<td>5.0</td>
</tr>
</tbody>
</table>

*Based on three pneumotachograph recordings selected in accordance with the recommendations of Chinn and Cotes; provided that the FVC values were within 5% of the maximum value.
†Based on four Wright peak flow recordings.