5.14 Assessment of an optimised tobacco smoking exposure calculation

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Background: Tobacco smoke is a determinant of lung function in exposed individuals. The "pack-year history"(PYHx) is commonly used to quantify tobacco exposure [(years_smoked*average_daily_cigarettes)/20] but may be insensitive to periodic variations in smoking intensity. We explored whether exposure estimates generated by a refined approach to PYHx calculation ($PYHx_{detailed}$) vary significantly from the traditional approach ($PYHx_{trad}$), and correlate more closely with lung function.

Methods: We surveyed consecutive ever-smoking patients attending St Vincent's University Hospital PFT lab over a 3-week period. $PYHx_{trad}$ and $PYHx_{detailed}$ were calculated using average daily tobacco consumption for each decade. Correlation between exposure and $FEV_{1\%predicted}$ was assessed.

Results: 105 patients were included. $PYHx_{trad}$ and $PYHx_{detailed}$ were strongly correlated (rho=0.9), however increasing $PYHx_{trad}$ was associated with a decrease in $PYHx_{detailed}$ (-0.76%$PYHx_{detailed}$ per unit increase in $PYHx_{trad}$, p=0.001, Figure 1). $PYHx_{detailed}$ correlated more strongly with $FEV_{1\%predicted}$ (-0.48% per unit increase in $PYHx_{detailed}$, p<0.001, R^2=0.135 vs -0.22% per unit increase in $PYHx_{trad}$, p=0.018, R^2 =0.055).

Conclusions: $PYHx_{trad}$ may overestimate tobacco exposure, especially at higher calculations. $PYHx_{detailed}$ correlates more closely with $FEV_{1\%predicted}$ and may offer more accurate estimates of tobacco exposure, with potential for use in the research setting.

Keywords: Smoking, Tobacco, Spirometry, Pack-Years

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Comparison of percentage difference between the two PYHx
calculation methods in relation to traditional PYHx calculation

Percentage difference calculated as [(detailed PYHx - traditional PYHx)/traditional PYHx * 100]