Blood Pressure and Lung Function in 12 year olds from the Gateshead Millennium Study

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Introduction

Impaired lung function is associated with increased blood pressure in adulthood[1]. It has also been found to increase the risk of developing cardiovascular diseases, of which high blood pressure is a risk factor.

Detecting an association earlier can help to identify individuals at most risk and potentially prevent development of high blood pressure and cardiovascular disease.

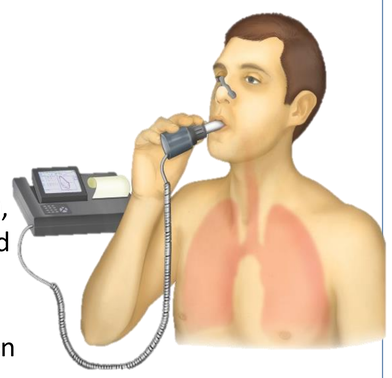
Aims

- To investigate the association between blood pressure and lung function at age 12
- To see if other factors such as gender, height or BMI affect this

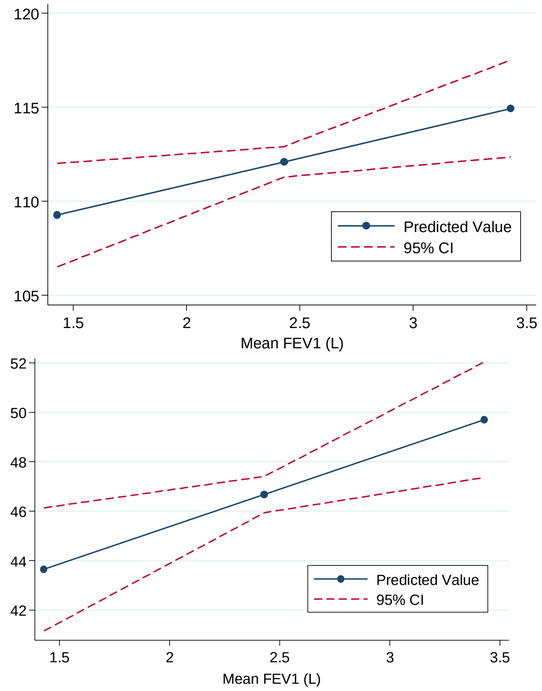
Method

The study used data collected from 501 children aged 12, from the Gateshead Millennium Study- an ongoing study following a group of children born in 2000 in the Gateshead region [2].

- Spirometry was used to measure lung function (FEV_1 and FVC) at age 12
- Blood Pressure (systolic, diastolic and pulse pressure) was measured at age 12
- Age, height (m), BMI (kg/m^2), smoking habit and household exposure to smoking were recorded at age 12
- Gender and social deprivation (Townsend score) were recorded at birth



Results



Predicted values for systolic blood pressure and pulse pressure using mean FEV_1, adjusted for gender, age and height (m)

Linear Regression was used to assess the association between lung function and blood pressure, taking the other variables into account.

Statistically significant associations ($p<0.05$) were found between:

- Systolic blood pressure and FEV_1 and FVC
- Pulse pressure and FEV_1

For every 1L increase in FEV_1:

- Systolic blood pressure increases by 2.83mmHg
- Pulse pressure increases by 3.03mmHg

For every 1L increase in FVC

- Systolic blood pressure increases by 2.91mmHg

Discussion

The results show that as lung function increases at age 12, blood pressure increases.

Only the association between FEV_1 and pulse pressure remained significant after adjustments for all other factors

Adjustment for BMI made all other associations non statistically significant

There is a need to promote healthy BMI in order to have better lung function, blood pressure and health in later life

Conclusions

The study has found that

- **Greater lung function is associated with higher blood pressure in 12 year olds.**
- BMI affects the association and so could be a confounding factor
- Future work can look at how the association changes with age and BMI intervention

Glossary

Spirometry: individuals blow into a tube, the volume of air forced out of the lungs is measured by a machine.

FEV_1: Forced expiratory volume in 1 sec,(L). Volume of air blown out of lungs as quick as possible in 1 second

FVC: Forced vital capacity (L) : volume of air blown out as hard as possible for as long as possible.

References:

1. Sparrow D, Weiss ST, Vokonas PS, Cupples LA, Ekerdt DJ, Colton T. FORCED VITAL CAPACITY AND THE RISK OF HYPERTENSION: THE NORMATIVE AGING STUDY. American Journal of Epidemiology. 1988 April 1, 1988;127(4):734-41
2. Parkinson KN, Pearce MS, Dale A, Reilly JJ, Drewett RF, Wright CM, et al. Cohort Profile: The Gateshead Millennium Study. International Journal of Epidemiology. 2011 April 1, 2011;40(2):308-17.

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