## Respiratory disease

# Breathlessness independently associated with obesity and weight gain in adult life

Middle-aged individuals with a high body mass index (BMI) and those whose BMI had significantly increased since the age of 20 had an increased prevalence of breathlessness, a population-based study has found.

A cross-sectional analysis of the Swedish Cardiopulmonary Bioimage Study (SCAPIS) was carried out. There were 13,437 individuals, mean age 57.5 years, 52.5% women, in the study population.

Current BMI was calculated and BMI at age 20 estimated using recalled weight and current height. Waist and hip measurements were obtained. $FEV_1$, FVC and CO uptake were also calculated.

Exercise levels were categorised as: high (regular hard exercise ≥ 30 min, > 3 times/week); medium (walking or cycling for at least 4 hours per week) or low (spending most leisure time at sedentary activities with light physical exercise < 2 hours per week).

Activity-related breathlessness was defined as an mMRC breathlessness score ≥ 1. This scale is the most commonly used tool for categorising the functional impact and disability from breathlessness in daily life.

Mean current BMI was 26.8 kg/m$^2$ and mean BMI at age 20 was 21.9 kg/m$^2$. Of those with a normal BMI at age 20, 48% had become overweight and 19% obese. Nearly one in ten participants (9.6%) reported breathlessness (mMRC ≥ 1).

Individuals with breathlessness were more likely to be women (67% vs 51%), had similar BMI at age 20 as people without breathlessness but higher current BMI. They also had more central obesity, more comorbidities, were more likely to be smokers, did less exercise and had worse lung function than individuals who were not breathless.

Obesity was strongly associated with increased breathlessness; odds ratio (OR) 3.54 (95% CI: 3.03-4.13) even after adjusting for potential confounders (age, sex, current smoking, airflow obstruction, exercise level and comorbidities).

Irrespective of current BMI, a larger increase in BMI since the age of 20 was associated with a higher prevalence of breathlessness.

Current BMI and change in BMI since age 20 were independently associated with breathlessness when analysed separately.

Those whose BMI had increased since the age of 20 had higher current waist circumference, more central obesity, and were more inactive. Compared with men, women had a markedly steeper increase in breathlessness prevalence with higher BMI.

The probability of breathlessness increased more steeply with higher BMI in people with lower absolute FVC. The higher breathlessness prevalence in obese women compared with obese men was related to their lower absolute FVC.

Obesity is known to be associated with markedly increased prevalence and severity of activity-related breathlessness. However, no previous study has evaluated the relation between change in BMI over time and current breathlessness.

The higher prevalence of breathlessness in overweight and obese individuals does not seem to be explained by a higher prevalence of comorbidities. Only a small part of the association between BMI and breathlessness seemed to be mediated through a decrease in lung volume as evidenced by FVC. It is likely that obesity increases breathlessness mainly through the extra workload and associated increased respiratory demand.

It is important for GPs to be aware of the impact of obesity on breathlessness especially for patients with reduced lung volumes.

**DR PETER SAUL**

**Ekstrom MP, Blomberg A, Bergstrom G et al. The association of body mass index, weight gain and central obesity with activity-related breathlessness: the Swedish Cardiopulmonary Bioimage Study. *Thorax* 2019;74:958-64**

## Diabetes

# Incidence of type 2 diabetes varies markedly between occupations

Men employed as professional drivers, and manufacturing or agricultural workers were three times more likely to develop type 2 diabetes compared with university teachers and architects, in a national study from Sweden.

Likewise, women who were cleaners or kitchen assistants were far more likely to develop the condition than physiotherapists or dental hygienists.

Of particular importance is the finding from the health data that the occupation followed is an association with diabetes incidence and that the occupation itself is not a causative factor.

The Swedish Total Population Register was used to identify all Swedish citizens born between 1937 and 1979. Of this 5,445,478 cohort, 4,550,892 (83.6%) were employed for at least two years between 2001 and 2013, and these subjects formed the study population.

The participants were followed up for the incidence of type 2 diabetes from 2006 to 2015. The Swedish national prescription register was established in 2005 and was the main source of diabetes information. Individuals with diabetes were identified by record linkage to this register and also the national patient register.

Details on participants' occupation between 2001 and 2013 were gathered from the Longitudinal Integrated Database for Health Insurance and Labour Market Studies. Data on lifestyle factors such as

exercise levels and smoking, and BMI were obtained from the national conscription and medical birth registers. Military conscription was mandatory for men in Sweden until 2009.

The age-standardised incidence of diabetes per 1,000 person-years was 5.19 (95% CI: 5.17-5.22). It was higher in men 6.36 (95% CI: 6.33-6.40) than in women 4.03 (95% CI: 4.00-4.06). In both sexes, there was a substantial difference in incidence across the 30 most common occupations.

**Occupations with the highest incidence of diabetes in men**
- Manufacturing workers (9.41 per 1,000 person-years)
- Motor vehicle drivers (9.32)
- Agricultural and other mobile plant operators (8.31)

**Occupations with the lowest incidence of diabetes in men**
- College, university teachers (3.44 per 1,000 person-years)
- Architects and civil engineers (3.83)

**Occupations with the highest incidence of diabetes in women**
- Manufacturing workers (7.2 per 1,000 person-years)
- Cleaners (6.18)
- Kitchen assistants (5.65)

**Occupations with the lowest incidence of diabetes in women**
- Physiotherapists, dental hygienists (2.20 per 1,000 person-years)
- Writers, creative or performing artists (2.27)

The health data suggest that the individuals who took up employment in low-risk occupations already had lower BMI, were less likely to smoke and had higher levels of exercise than those in the higher risk occupations, and that risk of diabetes in the occupation groups showed a linear relationship between lifestyle factors and incidence.

For example, conscription data showed that the prevalence of overweight at the age of 18 was more than 16% in those men who subsequently became drivers, agricultural or mobile plant workers compared with 6% in men who became university teachers.

Likewise, around 30% of women in the highest diabetes incidence groups were overweight at age 29, and 24-30% were smokers, compared with 18% who were overweight, and only »



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6% who were smokers, in the occupational groups with lowest incidence.

The authors conclude: 'Our study shows that there are occupational groups, including motor vehicle drivers, manufacturing workers and cleaners, where the incidence of type 2 diabetes is increased three fold and, furthermore, that employees in these occupations already have a higher prevalence of lifestyle risk factors in their twenties and thirties.

'If interventions could reduce weight and smoking and increase physical activity among employees in these occupations, major health and productivity gains may be made.'

Diabetes causes a lot of lost days from work, and the workplace is a very accessible target for health improvement initiatives. The increasing evidence for lifestyle measures to prevent and possibly cure type 2 diabetes would make this a very effective public health intervention.

**DR MATTHEW LOCKYER**

**Carlsson S, Andersson T, Talback M, Feychting M. Incidence and prevalence of type 2 diabetes by occupation: results from all Swedish employees. *Diabetologia*; Published online 17 September 2019**

## Sexual health

# Gonorrhoea may be transmitted by kissing in men who have sex with men

Men who have sex with men (MSM) may transmit oropharyngeal gonorrhoea to partners by kissing, a cross-sectional study from Australia has found.

Patients attending a large sexual health clinic in Melbourne between March 2016 and February 2017, were asked to complete a computer-assisted questionnaire. The questions covered demographics and sexual practices including kissing with tongues. Univariable and multivariable logistic regression analyses were carried out to examine associations between oropharyngeal gonorrhoea and three categories of partners; kissing only partners, sex only partners, kissing with sex partners.

A total of 3,677 responses were eligible for analysis. The median age of respondents was 30 (interquartile range 25 to 37), 57% were born in Australia and 2.5% had been diagnosed with HIV.

Positivity for oropharyngeal gonorrhoea was 6.2% (95% CI: 5.5-7.1%), anorectal gonorrhoea 5.9% (95% CI: 5.2-6.8%), urethral gonorrhoea 2.7% (95% CI: 2.2-3.3%). Virtually all men, 95.2%, (95% CI: 94.5-95.9%) had kissing with sex partners, 70.4% (95% CI: 68.9-71.8%) had kissing only partners, and 38.3% (95% CI: 36.7-39.9%) had sex only partners in the past three months. Just over a quarter (26.7%) of men (95% CI: 25.3-28.1%) had partners in all three categories.

Having a greater number of kissing only partners or kissing with sex partners was significantly associated with oropharyngeal gonorrhoea in both univariable and multivariable analyses. The adjusted odds ratio (OR) of having oropharyngeal gonorrhoea was 1.46 (95% CI: 1.04-2.06) for men with four or more kissing only partners and 1.81 (95% CI: 1.17-2.79) for four or more kissing with sex partners, compared with men who had one partner or no partners in these categories.

Gonorrhoea infection is common in MSM. The rise in infection rates is a public health concern particularly as more antibiotic-resistant cases have been documented in this group in many countries.

Most strategies to prevent transmission of gonorrhoea have concentrated on encouraging the use of condoms for anal sex among MSM. The evidence for this approach is lacking as modelling studies suggest that the proportion of incident gonorrhoea transmission from urethra to oropharynx or anorectum is relatively small. Gonorrhoea is found in saliva and some earlier studies had suggested transmission from the oropharynx might be more common than expected. Tongue kissing as a mode of transmission has been recognised in case reports as far back as the 1970s.

This is the first study that provides empirical evidence of an association between kissing and oropharyngeal gonorrhoea transmission among MSM. The study authors conclude: 'Our results suggest kissing with or without sex may be a risk factor for oropharyngeal gonorrhoea.'

One challenge is what public health message to promote to MSM as previous studies have shown that this group regard kissing as important for intimacy. However, some MSM might be willing to avoid sexual practices such as oro-anal sex to reduce this risk.

**DR RICHARD MA**

**Chow EPF, Cornelisse VJ, Williamson DA et al. Kissing may be an important and neglected risk factor for oropharyngeal gonorrhoea: a cross-sectional study in men who have sex with men. *Sex Transm Infect*. Epub ahead of print 9 May 2019. doi:10.1136/sextrans-2018-053896**

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