

Gender-difference in the association between BHR and asthma symptoms

Tine H Malling¹, Torben Sigsgaard², Lars R Skadhauge³, David Sherson⁴, Jesper Bælum⁵, Gert Thomsen⁶ and Øyvind Omland^{7,2} and the RAV group.

¹Department of Occupational Medicine, Aalborg Hospital, Århus University Hospital, Aalborg, Denmark; ²Institute of Public Health, University of Århus, Århus, Denmark;

³Department of Occupational and Environmental Medicine, Hospital of Southern Jutland, Haderslev, Denmark; ⁴Department of Occupational Medicine, Vejle Hospital, Vejle, Denmark;

⁵Department of Occupational Medicine, Odense University Hospital, Odense, Denmark; ⁶Department of Occupational Medicine, Hospital of Southwest Denmark, Esbjerg, Denmark and

⁷Department of Occupational Medicine, Denmark, Århus University Hospital, Aalborg, Denmark.

Aim: To analyse for associations between asthma symptoms, BHR, and gender

Methods:

In a cross-sectional Danish multicenter-study of asthma (ECRHS protocol) 1,028 subjects aged 20-44 years were eligible for analysis of associations between asthma symptoms, BHR, and gender.

Asthma symptoms were defined by an 8 items asthma score (Pekkanen, J. et al, Eur. Respir. J. 2005; 26: 28-35). BHR was defined as $\geq 20\%$ decrease in FEV₁ by Methacoline-challenge (cumulative dose 2 mg).

Table 1. Characteristics of study population n=1028

	Female	Male
Mean age, years (SD)	34.4 (7.2)	35.0 (6.9)
BHR, n (%)	164 (29)	87 (19)
BMI		
<20 kg/m ² , n (%)	53 (9)	10 (2)
20-25 kg/m ² , n (%)	284 (51)	208 (44)
25-30 kg/m ² , n (%)	122 (22)	203 (43)
>30 kg/m ² , n (%)	102 (18)	48 (10)
Smoking		
Never, n (%)	298 (53)	268 (57)
Former, n (%)	93 (17)	67 (14)
Current, n (%)	168 (30)	134 (29)

Results:

Demographic data for study population is shown in table 1 BHR was present among 164 (29%) females and 87 (19%) males. More females reported asthma symptoms. Figure 1 shows associations between BHR and asthma score by gender.

Significant interaction between gender and asthma score was seen, $p=0.002$.

Conclusion:

Despite higher prevalence of both asthma symptoms and BHR among females, the association between these clinical outcomes is strongest among men. It remains unclear whether there are genuine gender-differences in asthma or gender-differences in the perception of asthma symptoms. In either way, the result suggests that gender should be considered in population-based studies of asthma.

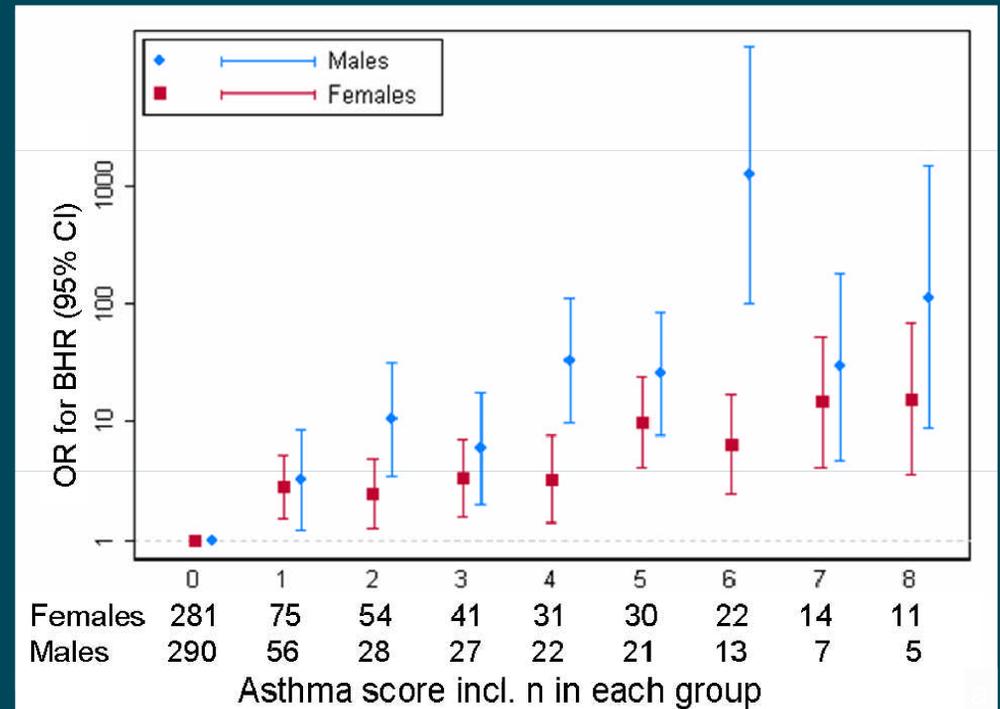


Figure 1 OR for BHR by number of symptoms in asthma score in males and females. The model is adjusted for age, study center, lung function (best performed FEV₁), BMI and smoking habits.

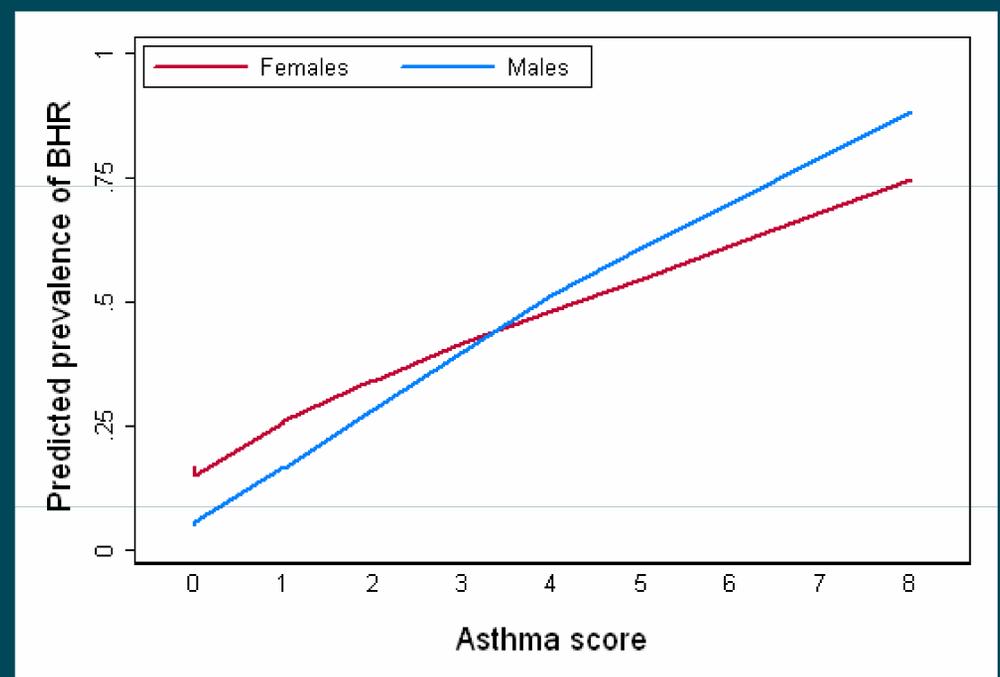


Figure 2 Calculated predicted prevalence of BHR by number of symptoms in asthma score in males and females. The model is adjusted for age, study center, lung function (best performed FEV₁), BMI and smoking habits.

Questions used for defining Asthma score by Pekkanen et al, 2005:

1. "Have you had wheezing or whistling in your chest at any time in the last 12 months?", in combination with: "If yes: Have you been at all breathless when the wheezing noise was present?".
2. "Have you woken up with a feeling of chest tightness at any time in the last 12 months?".
3. "Have you had an attack of shortness of breath that came on during the day when you were at rest at any time in the last 12 months?".
4. "Have you had an attack of shortness of breath that came on following strenuous activity at any time in the last 12 months?".
5. "Have you been woken by an attack of shortness of breath at any time in the last 12 months?"
6. "Have you ever had asthma?".
7. "If yes: Have you had an attack of asthma in the last 12 months?".
8. "If yes: Are you currently taking any medicines for asthma?".

Fund providers:

Danish Lung Association, West Danish Research Forum for Health Science, Spar Nord Foundation, and Herta Christensens Foundation.