was 96.2%. AS was determined by a positive response to any of: have you (1) been woken by an attack of shortness of breath at any time (2) had an attack of asthma (3) are you currently taking any medicine for asthma (4) had wheezing or whistling in your chest when you did not have a cold, R was determined by positive response to do you have any nasal allergies including hay fever. Symptoms prevalence was 9.2% for the first time, 23.3% for 2–4 years, 6.8% asthma medication 0.9%, nasal allergies 20.5%. Overall AS prevalence was 22.6% in the study population. This symptomatic group is currently undergoing the second stage of the investigation involving a detailed questionnaire, spirometry and allergy testing. This study was supported by ASTRA and Society for Pulmonary Diseases.

P2197
Comorbidity in Asthma and COPD in Dutch General Practice
D. Bijl, J. van der Velden. Netherlands Institute of Primary Health Care, Utrecht, the Netherlands

Aim of the study. To describe comorbidity in asthmatic and COPD-patients in Dutch general practice.

Patients and methods. Secondary analysis of data from the Dutch National Survey of General Practice (1987–88), covering 161 Dutch GPs with a total list size of 355,000 patients. Comorbidity was defined as diseases or problems, that according to the GP, had a direct relation to the reason for encounters or the diagnosis.

Comorbidity was registered as underlying diseases in the National Survey. Results. GPs registered 3351 episodes of asthma (n = 1276) and COPD (n = 2075) in patients 12 years and older. In these 3351 episodes 713 (21.3%) underlying diseases were registered. Significantly more underlying diseases were registered in asthma (216 ± 16.9%) than in COPD (497 ± 23.9%) (chi-square p = 0.03). Hypertension (p = 0.048), chronic heart failure (p = 0.006) and peripheral vascular disease (p = 0.006) were significantly more often registered in COPD patients than in asthmatics. Furthermore, relationship problems and addiction problems were quite often registered as underlying disease. Compared to all comorbidity registered in the National Survey comorbidity in asthma and COPD is more prevalent.

Conclusion. Comorbidity is quite prevalent in asthma and COPD. It results in additional health problems, mainly in the field of cardiocirculatory–vascular diseases. In relation to the quality of care of asthma and COPD and the development of guidelines attention to comorbidity is necessary. (1) Bill D, Dekker FW and Van der Velden J. Quality of care of asthma and COPD in Dutch General Practice. Eur Resp J 1994; 7: 18–417.

P2198
Bronchial Asthma Symptoms in the Patients with Chronic Bronchitis
A. Bliznakova, Y.S. Lebedin, G.L. Osipova. Scientific Institute of Pulmonology, Moscow, Russia

It is difficult enough to distinguish the patients with bronchial asthma (BA) if they suffer from chronic bronchitis (CB). Randomized city population study including the sample of 760 subjects of both sexes (252 males and 454 females) aged 25–64 permitted to analyse the serum IgE levels in relation to the presence or the absence of bronchial asthma symptoms. UATLD Questionnaire was used. The criterion of CB was generally accepted; BA criterion was the following: two positive answers among such questions as attack of coughing or wheezing in the last 12 months. It was analysed logarithmic values of serum IgE. The patients were consulted by two doctors independently. BA was found in 23.4% of the patients with CB and in 2.0% of the subjects having no such symptom (p < 0.05). The geometrical mean of serum IgE was 3.4 ± 1.6 IU/ml in the patients with chronic bronchitis and 4.6 ± 1.6 IU/ml in the subjects with bronchial asthma (p = 0.001). In the patients with CB and coughing plus wheezing in the last 12 months IgE level was found lower: 4.3 ± 1.8 IU/ml (p = 0.05). According to clinical study the specificity of BA criterion was 93% and sensitivity was 71%. Prognostic value was calculated as 69%.

Presented data allow to conclude that the criterion of BA may be very helpful in epidemiological and clinical study to recognize the patients with bronchial asthma.

P2199
Epidemiology of Nocturnal Asthma in a Rural Community of Northern Sicily
V. Bellia, R. Fusielli, G. Filippazzo, I. Cocilovo, F. Cibella, G. Cuttitta, G. Valenti, G. Bonsignore. Istituto Pneumologico dell’Università and Osservatorio Epidemiologico Regionale, Palermo, Italy

Nocturnal asthma (NA) is estimated to occur in 2/3 to 3/4 of patients; however there may be a gross overestimation: in fact available prevalence data do not pertain to the general population of asthmatics since derived from hospital series (Turner-Warwick, 1984) or from patients preselected because of active disease under treatment (Turner-Warwick, 1988). Therefore we evaluated the prevalence of NA-associated symptoms from data relevant to a prevalence study on asthma conducted in this area (Turner-Warwick, 1984). The general population sample (GPS) of 1100, randomly selected in a rural area of northern Sicily. To questions on frequent awakenings due to dyspnea or cough, a positive response was recorded respectively in 10 and 15% of asthmatics, as compared to 1.0 and 1.5% of GPS. Similarly 5 and 8.3% of asthmatics (0.9 and 1.6% of GPS), gave a positive response to questions on frequent occurrence of breathlessness or chest tightness at wake-up in the morning.

Occasional occurrence of the cited symptoms was recorded in 16.7 to 23.3% of asthmatics and in 2.3 to 4.9% of GPS. These rates increased in subjects aged over 65 yrs (occasional report in 26.7 to 46.7%), although a confounding effect of cardiovascular diseases may be important. These data confirm that NA is “a manifestation of more severe inflammation in the airways of subjects with asthma” (Gouttebroze et al. 1995) and as such it recurred in a percentage of patients much lower than previously estimated.

P2200
Single Breath Transfer Factor for Carbon Monoxide in Patients with Bronchial Asthma and Cold of a Norwegian Community Sample
I. Wele, P.S. Bakke, A. Gutvlev. Department of Thoracic Medicine, University of Bergen, Bergen, Norway

Limited Community based data is available on the distribution of transfer factor variables in healthy and diseased subjects in Northern Europe. In a cross sectional survey of a Norwegian general population sample of 1275 subjects aged 18–73 yrs examination with single breath transfer factor for carbon monoxide (TLCO) was performed. The subjects also were diagnosed as having bronchial asthma or chronic obstructive lung disease (COLD) based on a clinical and spirometric examination (Thorax 1991;46:663–70). The prevalences of bronchial asthma and COLD in this population were 2.4% and 5.4%, respectively. Reference values for TLCO were estimated from never-smoking subjects of the present sample without respiratory symptoms or disorders (Thorax 1992;47:167–73). When these reference values were applied on the entire sample mean (SD) TLCO in percent predicted (TLCOS) of bronchial asthma was 97% (13%) in men and 106% (15%) in women. Corresponding figures in patients with COLD were 82% (25%) in men and 90% (19%) in women, while in subjects with neither of the disorders the figures were 101% (15%) and 102% (14%). In conclusion, in this Norwegian community sample patients with COLD had reduced values of TLCO, while patients with bronchial asthma had normal values of TLCO. For both asthma and cold patients men tended to have lower values of TLCO than women.

P2201
The Importance of Asthma Education in Patients with Asthma

Despite recent developments in the diagnosis and treatment of asthma, there seems to be a rise in morbidity and mortality related to inadequate education of patients lacking necessary information about the disease. This study sought to evaluate patients’ information about their disease and its management and conducted training courses for all of the patients who attended the Allergy and Asthma Center of the Istanbul University with the collaboration of the Department of Health Education of Istanbul University.

Previously education and the monitoring of MDI use were scored by a vitalograph and an observer. Educational seminars of six sessions were held. The questionnaire and the monitored MDI use were repeated two times, one after two months and the other after a year. The results were as follows:

<table>
<thead>
<tr>
<th>Before education</th>
<th>End of 2nd month</th>
<th>End of a year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (65.9%)*</td>
<td>38.5 ± 14.26</td>
<td>87.14 ± 15.1</td>
</tr>
<tr>
<td>Group II (85%)</td>
<td>20.71 ± 17.11</td>
<td>87.11 ± 9.95</td>
</tr>
<tr>
<td>Proper MDI use</td>
<td>16/43 (37.25)</td>
<td>31/43 (72.09%)</td>
</tr>
<tr>
<td>Observer and</td>
<td>38/43 (88.86)</td>
<td>39/43 (89.46%)</td>
</tr>
<tr>
<td>vitalograph score</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*KS-knowledge score

This study helped reveal that patients do not have sufficient information about their disease and the use of MDIs, and that education and training can play a significant role in the disease morbidity and mortality.

P2202
Detection of Adult Asthma/COPD in General Practice
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1 Dept General Practice and Social Medicine, University of Nijmegen; 2 Dept Health Economics, University of Limburg, The Netherlands

In 10 general practices, a large sample (n = 1155) of the open adult population has been screened for (early) signs of asthma/COPD. Non steroid-dependent subjects with ages between 25 and 70 were included. Screening consisted of lung function measurements (PFEV1, VC and reversibility after 0.8 mg salbutamol) and a Dutch version of the MRC questionnaire. A mildly impaired lung function, the presence of symptoms or a combination of both rendered a positive screening result: these subjects were regarded as having an increased risk of developing asthma/COPD or were likely to have as yet undetected asthma/COPD. In this sample 5% (n = 60) of the 1155 subjects had positive screening results. After following these subjects over 6 months we confirmed every 3 months to accurately detect subjects with as yet undetected asthma/COPD and subjects with a rapid decline in lung function. Undetected asthma/COPD was defined as:

- at least 2 out of 4 periodical measurements: FEV1 ≤ pred – 2 sd or PEF ≤ 2 mg histamine/mg and FEV1 reversibility ≤ 15% of pred.

A rapid decline in lung function was defined as:

- a rapid decline in lung function was defined as:
decline in FEV1 ≥ 80 ml/year (linear regression) and FEV1 < 8 mg histamine/ml and/or FEV1 reversibility ≥ 10% of pred. A total of 384 subjects were willing to participate in the monitoring phase. 14% (n = 54) of 384 subjects had significant screening result as yet undetected asthma/COPD. In the remaining 330 subjects, 24% (n = 80) displayed a rapid decline in lung function. Throughout the study, there were no indications of recruitment or selection bias (tested statistically). More than 70% of subjects with undetected asthma/COPD and subjects with a rapid decline in lung function had never ever visited their general practitioner or pulmonologist for respiratory complaints before.

Conclusion: Generalizing our findings to the general population in our region, we observe that approximately 7% of the general population may be regarded as having as yet undetected asthma/COPD. In approximately 10% of the general population, a rapid decline in lung function can be seen.

P2203
Rates of Admission to University Hospital for Asthma
V. Petrovic, Lj. N yogori, M. Vukcevic, G. Gvozdenovic. Institute for Pulmonary Diseases, Clinical Center of Serbia, Yugoslavia

There has been considerable interest in hospital admissions attributed to asthma over past decades. The aim of this study was to describe trends in asthma hospitalization to University Hospital which is referral center for respiratory diseases. We examined hospital records with first discharge diagnosis (ICD 9, code 493) from 1988 to 1995. Time trends were calculated as percentage using the 1988 admission rate as basic index.

Year | Asthma admission | Hospital admissions in whole | % Asthma admissions | Increasing % of admissions related to asthma
--- | --- | --- | --- | ---
1988 | 115 | 5564 | 2.1 | 1989
1990 | 140 | 5702 | 2.5 | 1991
1991 | 182 | 6032 | 3.0 | 1992
1992 | 209 | 5832 | 3.6 | 1993
1993 | 310 | 5982 | 5.3 | 1994
1994 | 306 | 5962 | 5.1 | 1995
1995 | 240 | 5453 | 3.7 | Total
1996 | 254 | 4593 | 5.6 |

Total | 1696 | 45020 | X = 3.8 |

Distinct seasonal fluctuation was noticed. For each of the years 1988 until 1995 a large autumn increase in asthma admission occurred. The overall largest peak was in September-October when 343 pts (20%) from the whole group were hospitalized. A smaller peak occurred each year in January-February 302 pts (17.7%). Seasonal pattern of status asthmaticus admissions was similar. During 8 yrs 165 pts (9.7%) had status asthmaticum, 41 pts (24.8%) in January-February and 39 pts (24.8%) in September-October. Due to asthma 19 pts (1.1%) died. Annual death rate was 10 in five. Eight asthma deaths (42%) occurred in May and June, in conclusion: admission rates attributed to asthma showed upward trend through examined period for all ages and both sexes. Apparently steeper increase was until 1991 and than dramatically increased in 1992 and 1993. The observed increase may reflect an increase in prevalence or severity of asthma, a change in diagnostic, therapeutic or nosologic practices.

P2204
Labeling Shift from Bronchitis to Asthma: A Contributing Factor to the Rise in Asthma Mortality in Rio Grande Do Sul, Brazil?
J.M. Chatkin 1, M.W. Gerbase 1, C.C. Fritscher 1, C.M. Abreu 1, L.O. Bridi *, N.A. Fonseca 1, Barreto S.S. Menna 2. 1 Medicine, Universidade Federal do Rio Grande do Sul, Porto Alegre

An important rise in asthma mortality rates in the group aged 5 to 39 years old during the period 1970 to 1993. Using the least square method and the linear regression procedures, the annual variation of the mortality rates was calculated. The State of Rio Grande do Sul, Brazil could be the incorrect filling of the death certificates. A smaller peak occurred each year in January-February 302 pts (17.7%). A rapid decline in lung function can be seen.

P2205
Hay Fever and Asthma in an Urban Community in Norway
C. Svanes, E. Omenaas, G. Floge. Department of Thoracic Medicine University of Bergen, Norway

The association between asthma and hay fever is well known and may be related to common allergic disposition. We present results from a population-based survey in Norway 1991–1993, where a random sample of 4300 persons in the age group 20–44 years, of whom 80% responded, was investigated. Asthma symptoms, fever and possible confounding factors were recorded. The association between hay fever and asthma symptoms (last 12 months) was studied by logistic regression analyses, while adjusting for differences in smoking habits, hospitalisation for lung disease in early childhood, age, sex and body mass.

Hay fever was reported in 19% of the population (men: 18%, women: 20%). The prevalence decreased with age, and was higher among non-smokers. Asthma attacks and use of asthma medicine was eight-fold higher in persons with hay fever (asthmatic attacks: odds ratio = 8.4, 95% CI: 5.5–12.9; use of asthma medicine: OR = 7.5% CI 5.0–11.5), while less specific symptoms of asthma was more moderate associated with hay fever (night dyspnea: OR = 3.8, 95% CI 2.7–5.4; morning dyspnea: OR = 2.7, 95% CI 2.1–3.3; wheezing: OR = 2.1, 95% CI 1.7–2.5; dry cough: OR = 1.4, 95% CI 1.1–1.7).

Conclusion: An association between asthma and hay fever was confirmed. If fever was more strongly related to a physician’s diagnosis of asthma than to airway symptoms.

P2206
Is the Practice Ratio of Inhaled Corticosteroid: Bronchodilator Associated with Asthma Mortality in Deprived Areas?
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Previous work has shown family practices located in deprived areas with low practice ratios of inhaled corticosteroid/bronchodilator (C:B) had higher hospital admission rates for asthma. A symptom based postal questionnaire was used across a more detailed morbidity profile of asthma patients in two practices. One practice had a high C:B ratio (1.53) and the other a low C:B ratio (0.2). Both practices were located in deprived areas. All patients who had received a prescription for an asthma drug over the past 18 months were sent a questionnaire (n = 179 for practice with high C:B and n = 187 for practice with low C:B). The unadjusted response rate to the questionnaire was 85% and 74%. There was a significant difference between the practices in self-reported asthma symptoms for both the 5–44 age group (P < 0.0001; n = 60 and 75) and for those with a family practitioner’s diagnosis of asthma (P < 0.0001; n = 70 and 1). In the remaining subjects, a small decline in age sex, social class or smoking habits between the practices for either the 5–44 age group or the diagnosed asthma group. A family practice with a low practice C:B ratio had significantly greater asthma morbidity compared to a practice with a high practice C:B ratio, located in a similarly deprived area.

CFTR — Prevalence, diagnostic features and respiratory involvement and clinical care cystic fibrosis

P2307
Epidemiology of Cystic Fibrosis in Russia

Cystic Fibrosis (CF) is the commonest lethal recessive autosomal disease among Caucasian populations. The frequency of CF and CFTR gene mutations (especially of AF508 deletion) is variable in different countries. During last two years the frequency of CF in Russian population has been studied. We found that CF AF 1 in 12,000 newborns. The major AF508 mutation was found in 58% chromosomes of CF patients among Russian population and 41% chromosomes of CF patients in Moscow.

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency AF508</th>
<th>Frequency AF508</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>34%</td>
<td>21%</td>
</tr>
<tr>
<td>Moscow</td>
<td>48%</td>
<td>18%</td>
</tr>
</tbody>
</table>

The most common mutations in Russian population were different to those described in Europe. N1303K, 2143delT, 2184insA, G542X, W1282X, 3732<

P2207
Cystic Fibrosis (CF) is the commonest lethal recessive autosomal disease among Caucasian populations. The frequency of CF and CFTR gene mutations (especially of AF508 deletion) is variable in different countries. During last two years the frequency of CF in Russian population has been studied. We found that CF AF 1 in 12,000 newborns. The major AF508 mutation was found in 58% chromosomes of CF patients among Russian population and 41% chromosomes of CF patients in Moscow.