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*Chronic obstructive lung disease – epidemiology,
diagnosis and classification*

Chronic obstructive lung disease (COLD) is the medical terminology for two diseases – chronic bronchitis and emphysema – that are characterised by obstruction to airflow that interferes with normal breathing. The damage to the airways and lungs develops over time, cannot be reversed and there is no cure for COLD. COLD is the most common pulmonary dysfunction today and it is a growing cause of disability and mortality. COLP is the fourth leading cause of illness and death through the world (9, 10).

CAUSES AND SYMPTOMS

Emphysema is a progressive destructive lung disease in which the walls between the air sacks are damaged. As a result, the lungs lose their elasticity and breathing out becomes more and more difficult. Air becomes trapped in overinflated lungs. Consequently, emphysema reduces the normal elasticity of the lung, which helps to hold the airways open.

Chronic bronchitis is characterised by chronic cough and sputum production, intermittent wheezing with variable degrees of shortness of breath on exertion, recurring and continuing throughout most days of the month, three months of a year for two successive years without other underlying disease. Chronic bronchitis results from inflammation and swelling of the cells, which line the bronchus. This inflammation causes the production of excessive mucus. Both the swelling and the excess mucus contribute to the narrowing of the bronchi, making air exchange more difficult and increasing the risk of lung infections for the patient (7, 10).

Spirometry is one of the best tests for determining the presence of COLD. Calculating the ratio of FEV1 to FVC is the best method for determining the severity of airway obstruction. The characteristic feature for the COLD is the low ratio $FEV1/FVC < 0.7$ and the continuous declining of FEV1 being more than 40 ml a year (2, 9) – Table 1. COLD compared to asthma causes more serious airflow limitation and in a greater degree reduces the vital capacity (2).

RISK FACTORS

- **Smoking.** Cigarette smoking is the most common cause of COLD. Most people with COLD are smokers or former smokers. It is estimated that smoking caused 90% of all cases of COLD incidence and 80–90% of deaths in the course of COLD (8)
- **Occupational Risk Factors.** Occupational risk factors are connected with the air pollution and specific jobs. Working in a dusty area for many years

and breathing in various lung irritants, like pollution, dust, or chemicals (sulphur dioxide, nitrogen dioxide, ozone) over a long period of time may cause or contribute to COLP • Lung infections in childhood. The development of children's lungs is completed at the age of seven, therefore, common infections in childhood, especially before the age of two, can irreversibly damage the lungs • Genetic Factors. In rare cases (1–2%) COLP is caused by a gene related disorder called alpha 1 antitrypsin deficiency. Alpha 1 antitrypsin is a protein that inactivates destructive proteins responsible for emphysema (9) • Age. The risk of COLD incidence is connected with the age of the patient, and is the highest in those over 65 years old.

Table 1. Comparison of asthma to COLD

	Asthma	Cold
Risk factors	Atopy, exposure to allergens, lung infections	Cigarette smoking, air pollution, lung infections, low social status
Factors causing the symptoms	Inhaled irritants and allergens, cold air, exposure to dust and fumes, lung infections, emotional upsets, physical effort	Physical effort – in severe stage – just a little activity, lung infections
Symptoms	Whizzing, frequent coughing, especially at night. Symptoms appear in childhood and are not connected with smoking	Chronic cough and sputum production, wheezing, shortness of breath. Symptoms are progressive and occur daily. Most patients are middle-aged or older and they are smokers or former smokers
IgE concentration in serum	Usually increased	Usually it is normal
Spitometry	Normal in remission or during the treatment	The Tiffeneau index is diminished
Bronchodilator Reversibility Test	Usually positive	Usually negative
Peak Expiratory Flow Rate	Usually changes during the day	Usually doesn't change during the day

EPIDEMIOLOGY

In developed countries COLD is a growing cause of disability and mortality and is the fourth leading cause of death after the heart and coronary artery disease, cancer and accidents. At the same time COLD is the only disease whose death rate increases, in contrast to the heart and coronary artery disease. According to WHO, the COLD was the sixth major cause of deaths in 1990 and it is estimated that it will be the third in 2020. The social costs to the nation for COLD were on the twelfth position, and it is estimated they will be the sixth in 2020 (1, 2).

In Poland about 10% of adult population suffer from COLD. The recent researches, accomplished in 2001–2002, revealed that 9.8% of urban population at the age 41–72 suffer from COLD. Those figures are similar to European rates of 4–11% of adult population. It is highly probable that the number of sufferers has reached 2 000 000, and that figure makes COLD the third chronic disease in Poland. Half of the patients need systematic antismoking counseling (4, 8, 9).

In Poland COLD is responsible for 20% of disability pensions and COLD patients account for 3.6% of all hospitalised patients each year (5). According to TNS OBOP, 85% of sufferers do not know the most basic symptoms of COLD, while at the same time the disease is responsible for 2500000 death cases around the world (3, 6).

In 2004 the educational and diagnostic programme in early diagnosis of GOLD was introduced in Poland. The programme is financed by the National Health Fund. The general physicians and pulmonologists are responsible for addressing the programme to the patients who are over 39 and suffer from persistent cough or smoke cigarettes. The spirometry test and the antismoking counseling are provided. The educational programme gives hope that GOLD will be diagnosed early, before the severe symptoms appear, and quitting smoking will reduce the number of severe GOLD cases (4).

Complications. right sided heart failure, arrhythmias, pneumothorax, pneumonia, pulmonary embolism.

DIAGNOSIS AND CLASSIFICATION

A diagnosis of GOLD is determined on the basis of physical examination, a medical history and a spirometry test (3).

1. The symptoms of GOLD include cough, sputum production, and shortness of breath, especially with exercise. Cough is present mainly in the morning on most days of the year. The amount of sputum increases in the course of the disease and changes colour from transparent to yellow or greenish with the addition of pus. Shortness of breath usually develops when working hard or doing brisk activity, and it gradually gets worse.

2. Physical examination reveals: • cyanosis and the blue colour of oral mucosa • wheezing • diminished or distant respiratory murmur • increased rate of breathing • the pinkish neck and chest skin • barrel-shaped chest due to overinflated lungs • horizontal ribs • intercostal retraction • contraction of the muscles between the ribs during inhalation • laboured breathing and persistent air hunger even during rest or after minimal exertion • pulmonary function tests show decreased airflow rates while exhaling and over-expanded lungs (6, 7).

3. Pulmonary Function Tests (Spirometry): • calculating the ratio of FEV1 to FVC is the best method for determining the presence and severity of GOLD. The Tiffeneau index is diminished: FEV1/FVC < 0.7 (70%), and it reveals the obstruction • a characteristic feature of GOLD is continuous declining of FEV1 by more than 40 ml a year • Bronchodilator Reversibility Test. Patients are tested twice – once before bronchodilator (a beta2selective sympathomimetic) are given and once after one is administered. The test is positive if the FVC increases for about 12% and FEV1 increases for at least 200ml or 15% of the baseline FEV1 (2, 10).

4. Other pulmonary function testing: • diffusion capacity • chest X-ray • EKG • arterial blood gas.

Classification of the severity of GOLD: Stage 0 – At Risk for developing GOLD – Breathing test is normal. Mild symptoms that include a chronic cough and sputum production. Stage I – Mild GOLD – Breathing test shows mild airflow limitation (FEV1/FVC < 70%, but FEV1 > 80%). Stage II – Moderate GOLD – Breathing test shows a worsening airflow limitation. Usually the symptoms have increased, and shortness of breath develops (FEV1 50%-80%). Stage III – Severe GOLD – Breathing test shows severe airflow limitation (FEV1 < 30%-50%). Stage IV – Very severe GOLD – Breathing test shows very severe airflow limitation (FEV1 < 30%). Complications like respiratory failure or right heart failure may develop. The quality of life is greatly impaired and the worsening symptoms may be life threatening (9).

Differential diagnosis: GOLD should be differentiated from asthma, as the two diseases have obstruction of the airflow and the obstruction of normal breathing in common (6, 7, 9).

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SUMMARY

Chronic Obstructive Lung Disease (COLD) / Chronic Obstructive Pulmonary Disease (COPD) is characterised by airflow limitation in the airways that is not totally reversible. The limitation usually develops over time and is caused by the improper lung inflammatory response to harmful dusts and gases. Epidemiological research conducted in a few European countries has shown that 8–10 per cent of the population over 30 suffer from COLD / COPD. In Poland COLD / COPD is diagnosed in about 10 per cent of the population over 40; it is estimated that about 2 million people suffer from the disease. The death rate due to COLD / COPD and its direct complications (*cor pulmonale chronicum*) fluctuates between 14 and 15 thousand annually. After heart and blood vessel diseases, malignant tumours and sudden death, COLD / COPD is the fourth leading cause of death in Poland. COLD / COPD constitutes a very heavy social burden. It is estimated that, unless the contemporary tendencies in disease epidemiology in the world change, in the year 2020 COLD / COPD will become the third leading cause of death.

Przewlekła obturacyjna choroba płuc – epidemiologia, rozpoznanie, kwalifikacja

Przewlekła obturacyjna choroba płuc (POCHP) jest chorobą charakteryzującą się niecałkowicie odwracalnym ograniczeniem przepływu powietrza przez drogi oddechowe. Ograniczenie to zwykle postępuje i wiąże się z nieprawidłową odpowiedzią zapalną płuc na szkodliwe pyły lub gazy. Badania epidemiologiczne przeprowadzone w kilku krajach Europy wykazały, że na POCHP choruje 8–10% mieszkańców, którzy ukończyli 30 lat. W Polsce POCHP stwierdza się u ok. 10% populacji po 40

roku życia, szacuje się, że choruje ok. 2 milionów osób. Liczba zgonów z powodu POCHP i jej bezpośrednich powikłań (serce płucne) waha się w granicach 14–15 tysięcy rocznie. Jest to czwarta, po chorobach serca i naczyń, nowotworach złośliwych i śmierci z przyczyn gwałtownych, przyczyna zgonu w Polsce. POCHP stanowi bardzo poważne obciążenie społeczne. Szacuje się, że jeśli obecne trendy w epidemiologii chorób na świecie nie ulegną zmianie, to w r. 2020 POCHP stanie się trzecią co do częstości przyczyną zgonu.