

SPECIAL PATHOPHYSIOLOGY

RESPIRATORY SYSTEM

1. The hypoxic-hyperoxic lesion of alveolocytes type II leads to:

1. Mucus hypersecretion.
2. Disturbed synthesis of antiprotease inhibitor.
3. Ig A hyposecretion.
4. Secretion of specific enzymes.
5. Insufficient surfactant production.

2. Surfactant deficiency in the alveoles leads to:

1. Lyophilization of the alveolar membrane.
2. Expiratory collapse of the alveoles.
3. Substrate deficit in the alveoles.
4. Sudden stop of breathing.
5. Abrupt decrease of alveolar pressure.

3. Which respiratory stimulator best reflects the level of damage to the respiratory center?

1. Decreased pO_2 .
2. Increased pCO_2 .
3. Decreased pH.
4. Apomorphine.
5. Hyperprogesteronemia.

4. When the pleural cavity is filled with fluid this leads to:

1. Lung collapse and atelectasis.
2. Inhibited stimulation of the respiratory center.
3. Lung immune deficiency.
4. Increased proliferation of alveolar macrophages.
5. Increased lung compliance.

5. Which defense mechanism of the respiratory system has a reflex character?

1. Cough.
2. Alveolar macrophage system.
3. Mucocilliary escalator.
4. Antioxidant systems.
5. Nasopharyngeal filter.

6. Which of the following should be decreased for the patient to have oligopnea?

1. Dead space.
2. Tidal volume.
3. Respiratory rate.
4. Ventilation.
5. Diffusion.

7. Hyperpnea is breathing with:

1. Increased respiratory rate.
2. Increased tidal volume.

3. Increased ventilation.
4. Inadequately high effort.
5. Periodical apneic pauses.

8. The most important outcome of alveolar hypoventilation is:

1. Cyanosis.
2. Increased airway resistance.
3. Dyspnea.
4. Orthopnea.
5. Respiratory acidosis.

9. Which pathologic type of breathing represents with lung hyperventilation and alveolar hypoventilation at the same time?

1. Bradypnea with hyperpnea.
2. Tachypnea with hypopnea.
3. Tachypnea with hyperpnea.
4. Bradypnea with hypopnea.
5. Kussmaul's breathing.

10. What does ventilation/perfusion mismatch mean?

1. Absolutely increased or decreased ventilation and bloodflow in the lungs.
2. Inadequately distributed bloodflow in the lungs.
3. Limited capillary bloodflow during maximal inspiration.
4. Mismatch between the airflow in the lungs and capillary bloodflow.

5. Discrepancy between the ventilation and perfusion in the different parts of the lung.

11. What is true for a part of the lung with a ventilation/perfusion ratio = 10?

1. There is low alveolar pO₂.
2. There is high alveolar pCO₂.
3. There is increased physiological dead space.
4. There is a local hyperbaric effect.
5. Presents a risk for gas embolia.

12. What is increased when the respiratory rate >35/min ?

1. Absolute dead space in the lungs.
2. The impact of venous blood in the arteries.
3. The ventilatory effect of the dead space.
4. The right-left transpulmonary shunt.
5. The overall effect of bronchial resistance.

13. What is the common finding in the arterial blood of patients with ventilation/perfusion mismatch?

1. Hypocapnia.
2. Hypoxia.
3. Hypercapnia.
4. Hyperoxia.
5. Normocapnia.

14. The diffusion capacity of the lungs decreases in all of the following, except one:

1. Anemia.
2. Interstitial fibrosis.
3. Bullous emphysema.
4. Pulmonary edema.
5. Increased cardiac output.

15. Each of the following could reduce bronchial conductivity except for one:

1. Bronchospasm.
2. Altered sensitivity of the respiratory center.
3. Weakness of the respiratory muscles.
4. Increased residual volume
5. Edema and hypersecretion of the bronchial mucosa.

16. Hypercapnia could be due to:

1. Hyperventilation.
2. State of anxiety and excitement.
3. Hypoxic stimuli.
4. Drugs suppressing the respiratory center.
5. Increased physical activity.

17. Cyanosis in respiratory failure is mostly due to:

1. Polycythemia.
2. Hypercapnia.
3. Increased fraction of reduced hemoglobin.

4. Peripheral vascular spasm.
5. Decreased dyshemoglobin.

18. Which disease is typically accompanied by chest pain while breathing:

1. Pulmonary emphysema.
2. Bronchial asthma.
3. Tuberculosis.
4. Pleural impairment.
5. Pulmonary edema.

19. One of the most common symptoms in pulmonary diseases is:

1. Chest pain.
2. Orthopnea.
3. Muscle weakness.
4. Dyspnea.
5. Headache.

20. What is characteristic for obstructive pulmonary diseases?

1. Hyperventilation.
2. Decreased bronchial conductivity.
3. Increased bronchial resistance.
4. Decreased static lung volumes.
5. Decreased dynamic lung volumes.
6. 2, 3, 5.

21. What is characteristic for the bronchial obstruction in asthma?

1. Progressive and irreversible.
2. Progressive and reversible.
3. Remittent irreversibility.
4. Relapsing nature and irreversibility.
5. Sudden and non-repeated attacks.

22. The pathologic characteristics of bronchial asthma includes:

1. Bronchospasm, bronchial edema, viscous mucus.
2. Peribronchial and interstitial infiltrate.
3. Alveolar and peribronchial destruction.
4. Recurrent bronchial epithelial necrosis.
5. Alveolar-capillary destruction.

23. Which of the functional tests is a "conditio sine qua non" for diagnosing an obstructive pulmonary disease:

1. Diffusion testing.
2. Blood gas analysis.
3. Measurement of the static lung volumes.
4. Forced expiration.
5. Measurement of the lung compliance.

24. Tobacco smoking and polluted air lead to COPD by having a negative impact on:

1. Pulmonary immune reactivity.
2. The ratios between proteases/antiproteases and oxidants/antioxidants.
3. Laryngospasm and bronchospasm reflexes.
4. The ratio between alveolar cells type I and II.
5. Stress induced non-specific pulmonary resistance.

25. In manifested pulmonary failure the observed polycythemia is due to:

1. Decreased lysis of red blood cells.
2. Increased red blood cell life.
3. Hypoxia-induced erythropoiesis.
4. Dehydration and hemoconcentration.
5. Hypercapnia-dependent increased size of the red blood cells.

26. What is a common complication in the advanced stages of COPD?

1. Cor pulmonale chronicum.
2. Hypocapnia.
3. Anemic syndrome.
4. Pulmonary thromboembolism.
5. 1, 4.

27. Restrictive ventilatory disturbance leads to:

1. Cheyne-Stokes breathing.
2. Inhomogenous alveolar ventilation.
3. Decrease in the lung volumes.

4. Incomplete functional shunt.
5. Increase of the functional residual capacity.

28. In what case should you observe acute restriction?

1. Asthma attack.
2. Pulmonary edema. Pneumothorax
3. Chronic obstructive bronchitis.
4. Pulmonary emphysema.
5. Tracheobronchitis.

29. What is the key pathogenetic unit of pneumothorax?

1. Presence of air in the mediastinum.
2. Collapse of the alveoli.
3. Increased pleural resistance.
4. Presence of air in the pleural cavity.
5. 1, 2, 4.

30. Which are the direct consequences of air entering the pleural cavity?

1. Collapse of the alveoli.
2. Disturbed to imposible breathing.
3. Suppressed respiratory center.
4. Disturbed venous flow (into the heart).
5. 1, 2, 4.
6. 1, 2, 3, 4.

31. Pulmonary hypertension could be due to:

1. Chronic respiratory acidosis and hypoxia.
2. Chronic respiratory alkalosis and hypovolemia.
3. Loss of pulmonary capillaries.
4. Multiple pulmonary thromboembolism.
5. 1, 3, 4.
6. 1, 2, 3, 4.

32. What is necessary for the development of cor pulmonale chronicum?

1. Pulmonary hypertension.
2. Systemic hypertension.
3. Presence of pathologic breathing.
4. Increased respiratory workload.
5. Thoracopulmonary malformation.

33. What is the most important and definitive sign of respiratory failure:

1. Hypercapnia.
2. Arterial hypoxia.
3. Arterial hypoxemia.
4. Dyspnea.
5. Persisting cough with expectoration.

34. What is the basic pathogenic mechanism for hypercapnic respiratory failure:

1. Pulmonary edema.
2. Pulmonary thrombembolism.
3. Reduced pulmonary perfusion.
4. Alveolar hypoventilation.
5. Impaired diffusion of CO₂.

35. What could be the reason for arterial hypoxia in respiratory failure:

1. Anemia.
2. Alveolar hypoventilation.
3. Ventilation/perfusion mismatch.
4. Right-left shunt.
5. Alveolar hyperventilation.
6. 2, 3, 4.

36. What is the basic pathogenetic unit in the respiratory distress syndrome of the newborn:

1. Immaturity of the surfactant.
2. Bronchiolar constriction.
3. Pleural fibrosis.
4. Alveolar edema.
5. Narrow airways.

37. What is the key pathogenetic factor in the respiratory distress syndrome in adults?

1. Bronchospasm and laryngospasm.
2. Alveolar hyperventilation.

3. Increased permeability of the alveolocapillary membrane.
4. Pulmonary hypertension.
5. Systemic hypertension.

38. Which factors could lead to decompensation of chronic respiratory failure?

1. Pulmonary infection and bronchospasm.
2. Fever, physical exercise.
3. Disturbed drainage of secretions.
4. Suppression of the respiratory center.
5. All of the above.

39. What is a pathognomonic symptom for sleep apnea syndrome?

1. Daytime sleepiness.
2. Stop of breathing during sleep.
3. Snoring.
4. Cardio-vascular disorders.
5. Anemic syndrome.

40. What is the key pathogenetic unit in obstructive sleep apnea?

1. Collapse in the region of the pharynx.
2. Disorder in the respiratory center.
3. Bronchial obstruction.
4. Overweight.
5. Thoracic cage disorders.

41. All of the following could lead to acute respiratory failure, except for one:

1. Respiratory muscles paralysis.
2. Acute obstruction of the airways.
3. Respiratory center suppression.
4. Anemia and polycythemia.
5. Thoracic cage damages.

42. All of the following are diseases with impaired respiratory control, except for one:

1. Hyperventilation syndrome.
2. Cystic fibrosis.
3. Sudden infant death syndrome. / SIDS/
4. Sleep apnea syndrome.
5. Pickwick syndrome.

43. Which of the following statements, regarding the alveolocapillary destruction is FALSE:

1. Leads to reduced compliance of the lungs.
2. Has a key role for the development of pulmonary emphysema.
3. Decreases the diffusion capacity of the lungs.
4. Leads to airflow obstruction.
5. Leads to decrease of the lung total capacity.

44. In terms of tissue metabolism what does disturbed breathing mean?

1. Insufficient inhalation/exhalation.

2. Wasted ventilation.
3. Disturbed oxygen consumption and CO₂ production.
4. Disturbed gas transport in the blood.
5. Block of diffusion between blood and tissues.

45. The terminal vicious circle that leads to death in chronic obstructive respiratory failure includes:

1. Hyposensitivity of the respiratory center to CO₂.
2. Respiratory muscle fatigue.
3. Cough, wheezing, expectorations, dyspnea.
4. Hyperinflation and forcefully decreased respiratory volume.
5. 1, 2, 4.
6. 1, 2, 3, 4.

46. What is dyspnea?

1. Spontaneously occurring respiratory feeling.
2. A neural reflection of the metabolic activity.
3. Subconscious perception of gas exchange.
4. Unpleasant respiratory effort that engages the central nervous system.
5. Dyscrepancy between breathing and metabolism.
6. Voluntary breathing that supports physical effort.