

Pulmonary Edema/Repetitorium

Pulmonary edema

Pulmonary edema is an abnormal accumulation of fluid in the lung's intercellular space (interstitium), possibly also inside the alveoli.

Causes of pulmonary edema

Permeability disorder

- inflammation
- inhalation of irritating gases
- irradiation
- aspiration pneumonia
- disseminated intravascular coagulation
- alergická reakce
- renal failure

An increase in the hydrostatic pressure of the pulmonary capillaries

- valvular defects of the left heart
- left heart failure
- high blood flow through the lungs
- pulmonary vein obstruction

Reduction of blood plasma oncotic pressure

- hypoalbuminemia

Complex causes

- chronic hypoxia
- neurogenic pulmonary edema
- narcotic overdose (heroin)
- pulmonary embolism
- eclampsia



Pulmonary edema

Pulmonary surfactant and the consequences of its deficiency

Surfactant (surface acting agent) is a phospholipid substance that forms the inner lining of the alveoli. Due to the proportion of elastic and collagen fibers, the alveoli have an internal tendency to contract. Alveolar fluid also contributes to this tendency with its surface tension. The negative pressure in the pleural cavity during inhalation overcomes the elastic forces of the lung tissue, and the surfactant, dispersed inside the alveoli, reduces the surface tension, thereby reducing the overall respiratory work of the inspiratory muscles. Expiration is a passive process under physiological circumstances due to the elasticity of lung tissue. If liquid gets into the alveolus, the surfactant will be diluted and thus the surface tension and work of breathing will rise. In a situation where the work of breathing is not sufficient for the full development of the alveoli, the functional residual capacity also decreases ($FRC = RV + ERV$).

RDS

RDS (respiratory distress syndrome) is a condition in newborns (mostly premature) when the synthesis of the necessary amount of surfactant is insufficient (or completely absent). Each breath therefore requires a great deal of work of breathing, and the alveoli collapse during exhalation. Patients try to solve this situation by maintaining positive pressure in the airways during expiration, which is clinically manifested as grunting (sobbing breathing).

ARDS

ARDS (acute respiratory distress syndrome) represents a similar situation in adults, but it is caused by severe damage to the surfactant, e.g. by aspiration of an irritant. It manifests itself in acute respiratory insufficiency and usually leads to permanent fibrotic changes in the lung tissue.

Links

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Source

- VÍZEK, Martin. *Repetitorium* [online]. [cit. 2012-01-08]. <<https://web.archive.org/web/20130512032641/http://pf.lf2.cuni.cz/vyuka/repetitorium.html>>

Reference

Used literature

- GUYTON, Arthur C and John E HALL. *Textbook of Medical Physiology*. 11th edition. Elsevier, 2006. 0 p. 11; ISBN 978-0-7216-0240-0 .