

KINETOPROPHYLAXIS OF RESPIRATORY DECOMPESTATION

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Key words: kinetoprophyllaxy, respiratory physiology effort.

Abstract: There are direct interconnections between the effort physiopathology and cardio-respiratory system with the changes of somato-functional parameters during the tiring physical activities or with missing periods of time from activities those may determine the deconditioning of all body functions.

Introduction: to highlight the activity and the hard job of the respiratory system during the sustained physical activities and the adaptation capacity it must be presented some of the aspects of the physiology, etiopathogenesis and semiology. Breathing is one the vital functions of the human body and the respiratory process may be of factors. Some of those factors and elements that may influence radically the respiratory process and to disturb the good functionality are:

- The anatomical integrity of all elements parts of the respiratory system,
- The elements that maintain function must be with in normal parameters such as: trophicity; phagocytosis; neural; proprioception.

Also in the same context may be counted the genetic elements, congenital or acquired trauma, chronic diseases and comorbidities.

The environment in the which the activities are performed, also may influence the respiratory process regarding the air quality (O₂ saturation, temperature, humidity, purity) in the following stages:

- Pulmonary ventilation;
- Capillary alveolar of diffusion;
- Blood gases transport;
- Tissue breathing;
- Respiratory regulation.[4]

I specified the factors that may disturb the respiratory process and there were presented determining aspects which may be completed by the factor that sets in motion the entire mechanism of respiratory system.

The solicited through induced physical activity to the body and the answer of the adapted respiratory regulatory mechanism, complete the

functionality of the respiratory system. It will be presented aspects of the effort and its influence on the body, on the other way we will specify the method and the involved mechanism of the respiratory system regarding supporting the request induced by the elaboration of responsibilities.

We mention that in spite of the aspects which may influence and support the breathing process a very important role of the pulmonary alveols, where the alveolar capillary diffusion is performed (gases exchange) , if at this level a supplementary storage of oxygen is not realized, at the capillary level the entire respiratory process will be disturbed through maladaptive changes.

Scope and objective of the research: the scope of this research consists in the presentation of the benefits of kinetoprophylaxy applied to improve the respiratory function and the maintenance of a positive state of morphofunctionality that will be able to support the sanogenic mechanism in overload situation.

The objective of this research;

- The analysis of this speciality literature regarding the ergophysiology of respiratory function:
- Identification of the methods and kinetic specific means to increase the effort capacity and the prevention of respiratory deficits.

Material and method: the disease condition, of conflict is installing and begins due to imbalance between the functional respiratory capacity and the solicitations induced, at a given time, to respiratory system. In the lungs condition is vulnerable, and not prepared and trained for a specific effort conditions will not be able to support functional parameters at an optimal level in balance conditions.

To perform a physical activity there is need of permanent proprioceptive control, for example: the lifting of a weight. Demands a very good muscles strength of the upper limbs proportionality with that weight. The proprioceptive reflexes realize this continuing adaptation.

The respiratory mechanism in humans it looks like it is regulated by these reflexes starting at the respiratory muscles level, which are more important than the reflex of pulmonary relaxation.

The maintenance of a regulated current respiratory volume it is obtained through these proprioceptive reflexes. These reflexes which control inspiratory muscles determined by the discharge of neurons are determined in turn by stretching status of that specific muscle. In the muscle are described and free nerve endings that could play a role in direct proprioceptive reception to CNS.

The spirometry offers important data regarding the vital capacity, VC is determined through a maximum air inhalation, followed by a maximum air exhalation.

$$VC = CV + RIV + REV = 500 + 1500 + 1500 = 3500 \text{ ml};$$

- CV= current volume; RIV= reserve inspiratory volume; REV= reserve expiratory volume
- RIV= maximum volume of air that may be inhaled after a normal inhalation;
- REV= maximum volume air that may be exhaled after a rest respiration;
- IC= inspiratory capacity – maximum air volume that may be inhaled from the respiratory position.

$$IC = CV + RIV$$

The air left in the lungs at the end of a maximum is called residual volume $RV = 1500 \text{ ml}$ [1; 2; 3; 5]

MEVS= maximum expiratory volume per second, from the ventilation flow this is the most important parameter in spirometry MEVS is defined as the maximum volume of air exhaled from the lungs in the first second of a forced cage (from the level of total pulmonary capacity). MEVS expressed in liter per second (1/s) and it is corrected BTPS (body temperature pressure saturation). MEVS as VC has standard values at which the momentum values are reported. The decrease of MEVS shows the presence of a resistance on the air ways, in the bronchitis or in asthma or the decrease of lungs retraction elasticity in the case of emphysema.

Interpretation and clinical meaning

The ventilator dysfunctions are characterized through the decrease of MEVS and of indirect maximum ventilation, at the valves which are under the normal standards.

The reduction that may be produced through two different mechanism the restrictive ventilator dysfunction is a result of a decrease of vital capacity through loss of functional respiratory parenchyma. Pulmonary excisions, tuberculosis lesions, aggravated emphysema condensed or destructive parenchymal processes or through the limitation of the pump expansion pulmonary thoracic, pleural symphysis, pleural dysfunction, pulmonary fibrosis, pulmonary circulatory stasis, palsy or respiratory muscles paresis, etc.

The obstructive ventilator dysfunction, due to reduction of the air ways caliber (asthma, spastic bronchitis, obstructive emphysema, bronchic chronic bronchiolitis, etc) The presence of obstructive factors does not affect vital capacity (normal +/- values) but enhances the

resistance of the aerial flow in the airways and as a result decreases the DPEEP with which the vital capacity may be mobilized.[5; 9]

The physical effect determines the increase of vital capacity and the decrease of activity or long time immobilization determine a decrease of that and the installation dysfunctions at the somatic-functional level (some of them are irreversible) The limitation of physical activities favors the installation of processes of dysfunctions of the NMAK mechanism and implicitly of the cardio-respirator system (hypotonia, hypotrophy, retractsures, fibrosis, sclerosis, necrosis, etc) The processes of physiological aging also determine the deterioration of the pulmonary parenchyma progressive.[6; 8]

In the same context due the overload through different harmful stimuli to respiratory system may determine the installation of some malfunctions and respiratory deficits. To respond to the induced requests of respiratory system is required the realizations of prophylactic program that will maintain the body at a functional status as close as possible of the normality. From the respiratory dysfunctions semiology the most dysfunctions are dyspnea, thoracic pain, cough, expectoration, hemoptysis, fatigue, hircup and voice disturbances[1 p.204; 7]

The objective of kinetoprophylaxis program in the respiratory disorders:

- Maintenance/increase of pulmonary capacity;
- Maintenance/increase of range of motion –ROM of the thoracic cage and scapula-humeral joints;
- Maintenance/increase of muscles tone of the great muscular groups next to thoracic cage;
- Postural hygiene (education) through selfcontrol of the body posture to prevent vicious postures;
- Maintenance of normal parameters of IMC through selective nutrition;
- Maintenance of an outdoor program of consequent activities;
- Avoid activities in the harmful medium that may be dangerous for helth status.

Results and discussion:

It must be specified that the kinetoprophylaxis programs are elaborated and applied only after an morpho-functional assessment of systems and apparatus, to eliminate or diminish all pathogenic factors that may obstruct or compromise the devepelopment of the prophylaxis program. The establishment of the effort capacity and the manual charge of exercises program will be realized according to the specific protocols of training. The program must contain elements of

analytical gymnastics, respiratory exercises performed with machines or devices used in sports. Training through a program of physical exercises in a consistent modality it will be induced to the body a gradual and progressive facilitation that will determine positive adaptative mechanism of the respiratory system. The effort capacity will increase, the body health status will permit to face the overloading in instability regime answering positively without fatigue or incapacity.

Conclusions:

- The conflict status at the respiratory system level installs and the onset is due to the imbalance between respiratory functional capacity and the induced request at given momentum to respiratory system;
- A very importance role it is significant at the level of respective lung, the pulmonary alveols, where it is realized the diffusion alveolic-capillary (gases exchanges) if at this level a sufficient collection of O₂ for blood capillaris will be not realized, then the entire respiratory processed will be disturbed through maladaptative changes;
- Maintenance of a current respiratory volume regulated it will be obtained through proprioceptive reflexes;
- Physical effort determines the increase of vital capacity, and the diminishing of activity or prolonged immobilization determines a decrease of it, and the installing of deconditionings at the somatic functional level;
- The physical consistent exercises program realized will be induced to the body with a gradual progressive request, that will determine positive adaptative mechanism to the respiratory system.

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Kinetoprofilaxia decompensării aparatului respirator

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Cuvinte cheie: kinetoprofilaxie, fiziologia respirației, efort.

Abstract: Fiziopatologia efortului are legături directe cu funcția aparatului cardio-respirator, cu modificările parametrilor somato-funcționali în timpul efectuării activităților fizice solicitante sau cu perioadele lipsite de activitate, ce pot determina procese de decondiționare a tuturor funcțiilor organismului.