

Monitoring of Respiratory Responses at Rest and During Exercise

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Editorial

Normal broncho-motor tone is the result of a balance between adrenergic and cholinergic influences. When something disrupts this balance, bronchospasm may result. The characteristic findings in acute bronchospasm are mucus production, vascular engorgement, and submucosal inflammatory oedema [1]. The mechanisms of bronchospasm can be illustrated using asthma as a model. In asthma, an imbalance in autonomic nervous system activity causes a predominant parasympathetic influence, increasing broncho-motor tone and resulting in narrowing of bronchial and bronchiolar passages other receptors in the connective tissues of the airways and the blood are also stimulated, and mediator substances are released [2]. This response is called inflammation, and it plays a central role in the production of bronchospasm in the vast majority of respiratory disorders [3]. The mediator substances originate from the plasma, the adjacent cells, or the damaged tissue and are associated with at least eight major events, changes in vascular flow and calibre, changes in vascular permeability, leukocyte, exudation, margination, or clustering of leukocytes along the capillary endothelial cells at the site of injury, sticking, or adherence of the leukocytes to the endothelial surface at the site of injury, emigration, or leukocyte insinuation between endothelial cells, chemotaxis, or unidirectional migration of poly-morpho-nuclear leukocytes from the bloodstream to the site of injury in response to released attractants, and phagocytosis [4]. Although macrophages, leukocytes, and neutrophils assist in the elimination of an invading pathogen by means of phagocytosis, it is the action of the lymphocytes that is probably most critical [5]. Lymphocytes have been identified as the cornerstones of the immune process. Invading organisms or other irritants that elicit an immune response are referred to as antigens. Antigens stimulate the different types of lymphocytes stored in the lymph nodes to produce two mediator substances, antibodies or sensitized lymphocytes. Antibodies are produced by the interaction of antigens and lymphocytes in a process referred to as humoral immunity [6]. The humoral immunologic response causes the release of chemical mediators from mast cells and leukocytes-a type I sensitivity reaction. This immediate reaction is apparently related to antibody activity and occurs within ten to twenty minutes. The cell-mediated immunologic response takes approximately two days to develop, and is most likely due to the macrophage release of specific enzymes that produce inflammation sensitivity reaction [7]. Inflammatory reactions are treated with rapidly acting agents such as glucocorticoids, whereas reactions can be treated with less rapidly acting agents, which may have less profound side effects. Antibodies are also called immune-globulins, because many reside in the gamma-globulin fraction of the blood. Antibodies are generally grouped into five major classes, and the first four of these have been identified in respiratory secretions [8]. The humoral immunologic response causes the release of chemical mediators from mast cells and leukocytes-a type I sensitivity reaction. This immediate reaction is apparently related to antibody activity and occurs within twenty minutes [9]. The cell-mediated immunologic response takes approximately two days to develop, and is most likely due to the macrophage release of specific enzymes that produce inflammation sensitivity reactions [10]. Inflammatory reactions are treated with rapidly acting agents such

as glucocorticoids, whereas reactions can be treated with less rapidly acting agents, which may have less profound side effects.

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Conflict of Interest

None

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