RESEARCH STUDY TO IMPROVE RESPIRATORY HEALTH

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Certain individuals who have suffered from polio may have a weakened respiratory function. This problem affects those who have been left with a chest wall deformity or weakness of respiratory muscles (like the diaphragm). These individuals may feel no breathing difficulty for a prolonged period. However, with increasing age, respiratory function deteriorates and difficulties may occur. Moreover, those with the post-polio syndrome may have an accelerated loss of their muscle strength, potentially including the muscles of breathing.

A team of researchers (Dr Daria Trojan, Dr Angela Genge, Dr Basil Petrof, Dr Marta Kaminska, Mrs Franceen Browman, Respiratory Therapist, and Mrs Christine Kupka, research coordinator) from the Montreal Neurological Institute and the Royal Victoria Hospital (McGill University Health Centre), affiliated with the post-polio clinic of the Montreal Neurological Hospital, is presently conducting a research study aimed at improving respiratory health of persons living with the post-polio syndrome who are starting to have a drop in their respiratory function. Two other illnesses are included in this study, Steinert's myotonic dystrophy and amyotrophic lateral sclerosis. This study examines an exercise for the respiratory system – the "manual hyperinflation technique". It involves insufflating a volume of air into the lungs using a balloon (similar to those used in emergency situations for resuscitation), as if the person was taking a big breath. The amount of air that is insufflated (pushed in) somewhat exceeds that which the person could inhale on their own, given their muscle weakness. This allows to "recruit" a maximal lung capacity. This could be considered as physiotherapy for the respiratory system. The goal of these exercises is to maintain or improve the elasticity of the lungs and the chest wall. They tend to become stiff when not fully used, as is the case when there is respiratory muscle weakness.

These exercises are entirely safe. Their main inconvenience is related to the time required to perform them. For optimal results, it is suggested to do three to four sessions daily. People with more pronounced respiratory muscle weakness from various neurological conditions already commonly perform these exercises. In addition to increasing elasticity of the respiratory system and therefore facilitating breathing, they improve the strength of cough, which allows to clear secretions more effectively and potentially to decrease the risk of pneumonia in these patients. To present, these exercises have not been formally studied to find out if they help prevent deterioration of respiration. The study currently under way is innovative as its goal is to demonstrate a beneficial effect for individuals with only mildly reduced pulmonary function. Ultimately, these exercises might be able to slow down the progressive deterioration of respiratory function. When there is a more marked deficit in breathing, respiratory assistance during sleep is required using a ventilator which is a machine that pushes air through a nasal or oro-nasal mask, somewhat similar to CPAP machines used for sleep apnea. The ventilator allows an adequate exchange of oxygen and CO_2 by assisting the patient's weakened muscles with each breath. The "manual hyperinflation technique" could delay the moment when the use of a ventilator is necessary at night, by maintaining better lung health.

Those who have participated in the study have generally appreciated the experience. It is too early to draw conclusions on the effectiveness of the exercise on physiologic measures, but preliminary results are encouraging. At least some participants have noted improvement in their breathing and endurance, and it appears that benefits are most notable in those with the post-polio syndrome compared with the other two disorders studied. No complications have been observed. Researchers are confident that these exercises can really have a positive impact on those with weakening respiratory muscles, particularly those with post-polio syndrome. They continue looking for candidate subjects for this study.