Effective Exercise Activities for Adolescents with Asthma

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Introduction

Asthma is a leading cause of chronic illness in childhood. In our PICO question, our patient of interest was children with asthma, our intervention was physical activity, our comparison was understood to be versus other physical activities, and our desired outcome was to control and manage the child’s asthma during physical activity. In children with asthma, it has been recognized that the health of these children can be increasingly compromised due to the impact that asthma has on the participation in physical activity (Williams, Powell, Hoskins, & Neville, 2008). It is suggested that obesity and sedentary lifestyles may be risk factors for asthma development (Rundle et al., 2011). Therefore, it is crucial to find effective physical activities for children with asthma because evidence suggests that physical activity may reduce asthma symptoms through better lung functioning (Jones, Merkle, Fulton, Wheeler & Mannino, 2006). Physical activity can also alleviate the symptoms of weather changes, colds, irritants, the emotional stress of an asthma attack (Wang & Hung, 2009), and improve a child’s psycho-social development and quality of life (Van Veldhoven et al., 2001). In one study, a physical exercise program showed noticeable effects on children’s perceived physical competence which in turn had positive effects on self-esteem and self-worth, decreased anxiety, and increased coping with asthma (Van Veldhoven at al., 2001). Furthermore, physical activity is essential for a healthy lifestyle, and “development of good health and fitness habits in childhood is associated with physical fitness as an adult” (Van Gent et al., 2008). This is an increasing significant subject of interest due to the rise in childhood asthma, which has been deemed an epidemic now (Rundle et al., 2011). The PICO question that guided our research is, “In children with asthma, what physical activity would be most effective to the control and management of asthma?”
Review of Evidence

We searched several databases to find information on effective sports and exercise for adolescents with asthma, using phrases such as “asthma and exercise”, “asthma and sports”, “effective sports for adolescents with asthma”, as well as asthma and a couple of well-known recommended sports and activities. The CINAHL database supplied one research article that compared the habitual physical activity and fitness levels of asthmatic and non-asthmatic children. The SPORTdiscus database provided us with one research article that investigated the effects of a basketball training program on the quality of life, exercise capacity, and pulmonary function in adolescents with mild to moderate asthma. The Academic Search Premier database provided four research articles. The first article outlines the problem of physical inactivity among adolescents with asthma, explores the psychosocial dimensions that may explain inactivity levels, and recommends relevant interventions and strategies. The second one reviews physical conditioning and its effects on adolescents with asthma. The third one concentrates on sports participation, social impact, school attendance, and quality of life in adolescents with asthma. The fourth one evaluates the effects of a physical exercise programme for children with asthma. The Trip Database supplied a research article that conducts an around the clock study on four year old children with asthma enrolled in a Head Start program. They report on the correlations and determinants of physical activity, including asthma and allergy symptoms, among these children. Lastly, The Cochrane Library contributed one research article that investigated the effects of a six week swimming intervention on pulmonary function testing, peak expiratory flow monitoring, and the severity of asthma in 30 children with asthma.
Synthesis of Findings

Childhood asthma is one of the most common disorders of children and can have a considerable impact on their daily lives. A major problem in most children with asthma is that exercise causes shortness of breath, also called exercise-induced bronchoconstriction (EIB). Asthmatic children often avoid physical activity, which reduces their already poor physical condition, because of their physical limitations and EIB (Van Veldhoven et al., 2001). School instructors lack knowledge of how to manage an asthma attack and results in unnecessary restriction on physical activity (Williams et al., 2008). This physical inactivity can also lead to social isolation and low self-esteem. Sports and exercise can alleviate symptoms as well as improve a child’s psychosocial development and quality of life (Van Veldhoven et al., 2001). This synthesis will summarize the findings on the benefits and barriers to physical activity for adolescents with asthma, as well as explain some exercises that are proven to improve their asthmatic symptoms and quality of life.

The Benefits of Physical Activity

Many health benefits exist for children who participate in regular physical activity. Some benefits are increased aerobic fitness, improved ventilatory capacity and performance, and a lowered body composition (Welsh, Roberts, & Kemp, 2004). Several studies identified asthma related benefits from physical activity such as reduced hospital admissions, reduced absenteeism from school, fewer consultations with health professionals, reduced medicine use, and improved ability to cope with asthma. Sports and exercise are ways to socialize with peer, obtain self-confidence, and can improve self-esteem. The reluctance of children’s participation in exercise programs results in lower levels of fitness and may lead to poor psychological adjustment (Van Gent et al., 2008). Evidence suggests that adolescents with asthma should be encouraged to
participate in regular physical activity. This will improve asthma management, general health, and decrease the risks associated with physical inactivity (Williams et al., 2008).

**The Barriers to Physical Activity**

The three suggested interconnected factors that affect participation in physical activity by adolescents with asthma are the illness beliefs of adolescents, parental beliefs, and the knowledge and attitudes of teachers about asthma. Many adolescents believe that physical inactivity is an unavoidable part of having asthma. One study showed that adolescents believed that they would never be able to participate in physical activity and sports to the level they wanted. Parents play a big part in aiding their children in effectively managing their asthma. One study found that many parents modified the treatment plan set out by the health professional because of their beliefs about asthma. Many parents restricted their adolescent’s physical activity because of lack of information and misinterpretation of the information given. Many teachers are concerned about the risks of physical activity in children with asthma and instead deter them from activities. Surveys of teachers revealed a low knowledge of asthma management with exercise. Many are unaware that medication taken prior to exercise could effectively prevent attacks and that children with asthma could be as competent as healthy children in sports (Williams et al., 2008).

**Swimming**

Swimming is considered to be a more popular and safer form of activity for children with asthma. It causes less asthma attacks than land-based exercise and is frequently prescribed for asthmatic children (Basaran et al., 2006). One six week study revealed significant improvements of peak expiratory flow (PEF) and the severity of asthma in the experimental group. The patients who participated in the swimming intervention understood asthma better and changed their
medication from relieving medications to preventative ones (Wang & Hung, 2009). According to one study, the strongest predictor of activity of asthmatic adolescents was the season in which the physical activity was monitored. The children were significantly more active in the May-September period than the October through April period (Rundle et al., 2011). This is most likely due to the fact that dry inspired air, like the air throughout the fall and winter season, is a major contributor to EIB (Wang & Hung, 2009). The indoor swimming pool environment provides a warm and moist air inspirate, much like that of the summer and spring months, that is less asthmagogenic than the ventilator stimulus of other forms of physical activity. The benefits of a swimming program include improved cardio respiratory fitness and physical conditioning, fewer asthma attacks, improved asthma symptoms and respiratory function (Wang & Hung, 2009).

**Aerobic Fitness**

Exercise training can be beneficial to improving aerobic fitness in adolescents with asthma. One study showed that following a three month training program, the endurance test running times of adolescents with mild to severe asthma were halved (Welsh, Kemp, & Roberts, 2005). Another study focused on gymnasium and home exercises that consisted of group exercises in a gym and a weekly home exercise within a three month period. During the training, asthma and exercise information was provided to the children in improve their coping behavior. Maximal aerobic capacity was increased as well as the maximal performance on the cycle ergometer. The maximum time on the treadmill showed a significant increase of 50% for the experimental group. The parents of the children positively noted that they played outside longer and had more success and pleasure in sports. The children reported a better understanding of asthma control during physical activity (Van Veldhoven et al., 2001). It was said that if children with mild to moderate asthma were pre-medicated with a bronchodilator, their exercise
limitations and aerobic fitness should be comparable to the normal population. Evidence exists that the levels of aerobic fitness in severely asthmatic patients may be normalized by carefully supervised aerobic training (Welsh, Kemp, & Roberts, 2005).

**Basketball Training**

Basketball training is another physical activity that has been proved to be an effective sport for asthmatic children. Basketball training enables children to be socially active during exercise and make it more enjoyable at the same time. This team sport study was expected to increase compliance of adolescents with asthma to scheduled training sessions. The 8-week training program sessions consisted of a warm up, sub-maximal basketball training, cool down, and flexibility exercises. The results revealed improvements in the children’s quality of life and exercise capacity. The asthmatic adolescents’ quality of life could also be greatly affected by the psychosocial benefits of participating in a team sport and being able to socialize with other children. Eight weeks of regular basketball training proved to be an effective alternative program for asthmatic children (Basaran et al., 2006).

**Conclusion**

The study results provided in this evidence-based research concluded that physical activity plays an important role in the lifestyle and control of asthma symptoms of children with asthma. All studies had similar results in suggesting that swimming, basketball, and gymnasium exercise programs could be beneficial in the health of asthmatic children. These children should be encouraged to engage in “life-time” sports and physical activity and to change from a more sedentary lifestyle to a more physically active life style (Van Veldhoven et al., 2001). With proper diagnosis and the most effective treatment, children with asthma should be able to enjoy sports and exercise programs without experiencing asthma symptoms.
Consistency of Evidence

All of the articles used in this research paper have evidence supporting that in children with asthma physical activity can effectively help control and manage the symptoms of an asthma attack. Wang and Hung (2009), Welsh, Kemp, and Roberts (2005), and Basaran (2006) all agree that swimming is the most effective type of physical activity for children with asthma. Jones (2006) and Williams (2008) both agree that physical activity can also lead to weight loss in children, which is proven to reduce the symptoms of asthma. Basaran (2006) and Van Veldhoven (2001) agree that basketball and other types of exercise in the gymnasium are effective types of physical activity for children with asthma. Van Veldhoven (2001) states that physical activity is effective in helping children cope with asthma, but the results can only be measured after a long-term program.

There have been several studies performed to show that physical activities such as swimming, basketball, and basketball can effectively control and manage the symptoms of asthma in children diagnosed with asthma. The studies were well designed and the recommendation of physical activity was consistent among systematic reviews and individual studies. The benefits of physical activity in children with asthma greatly outweigh a sedentary lifestyle. There were no risks found for children with asthma to participate in physical activity. However, there was not a cost study found on the recommendation of physical activity in children with asthma.