

## **Introduction**

Asthma, with an estimated prevalence of 4.3% globally, is the most common chronic disease in paediatric population (To et al. 2012). Asthma accounts for about 3 million visits to the healthcare providers and over 0.2 million hospitalizations in an year among children (CDC, 2010). Adolescence can be seen as a period of psychological and physical transformation. Adolescence is an age group known to be accompanied with increased risk taking and impulsive behaviour and an increased sense of peer pressure. Asthma in adolescent and paediatric population is as a unique group with clinically defined issues in comparison to other age groups. The disease spectrum of asthma in adolescents has been presented quite diversely and asthma along with the related respiratory problems in adolescents seems to be associated with lack of proper diagnosis and poorly structured treatment regimen. Cigarette smoking (both active and passive) can be seen as a manifestation of risk taking behavioural changes in adolescent development. Smoking may accentuate symptoms and manifestations of asthma in adolescents and further complicate treatment and management strategy of this chronic disease. Asthma in adolescence is seen to be present with various psychosocial complications like risk taking behaviour encouraged by peer pressure, denial of the disease status by the patient, lack of caution with respect to following treatment regimen and also precautionary measures, lack of family support and less supportive attitude of schools/mates towards patients. Ignorance to commonly exacerbating agents also aid in increasing the vigour of asthma in adolescents. In order to effectively manage asthma in adolescent age group, the treating physicians will also have to take in to account various life style related complications like smoking and alcohol intake. Addressing to such issues are warranted for optimal treatment and management of asthma in paediatric population.

## **The case scenario**

The present case scenario is a good example to discuss the management of asthma in adolescents. Mark is an otherwise healthy, 17 year old male with history of asthma. Despite being an asthmatic for years, he never had to be admitted to hospital for any complications. On examinations and detailed work-up it was observed that Mark's best friend is Tom who has been reported to be a regular smoker and smokes about 10 cigarettes a day and Mark is also known to smoke occasionally. Mark is in direct contact with his pet cat on everyday

basis. Lately, Mark has been on prophylactic medications for asthma but has not been taking medicines since last 3 months. Before playing in a soccer match (in a low temperature atmospheric condition) he reportedly took extra reliever medicines (4 inhalations) and was reported to have cold as well (the coach was not informed about his medical condition). During the match Mark complaints of breathlessness but continues with the game after a short break following which he becomes unconscious, falls on the ground and is subsequently taken to hospital for further treatment and medications. He has been on ventilation and nebulization followed by transfer to the intensive care unit.

### **Smoking in adolescents with asthma**

This case scenario warrants that the need discussion on this serious health problem among adolescents. Studies in the peer reviewed literature give a detailed account of the complexities and comorbidities associated with asthma in adolescence (Boice 1998). In the above mentioned scenario an asthma patient of adolescent age group was keen to try smoking with some peer encouragement from his friend. A case-control study of 2,039 asthmatic adolescents and 2,039 age and gender comparable controls by Tercyak (2003) determined the prevalence of smoking in adolescents with asthma and associated factors like environmental smoking exposure, comorbid depressive symptomatology etc. It came with observations that the prevalence of ever smoking among asthmatic adolescents with was about 56%, also among asthma (ever smokers), the prevalence of giving to current smoking was calculated to be 48%. Also the same study reported that the most important psychobiological and social risk factors associated with smoking in asthmatic adolescents appear to be a) parents with history of smoking, exposure to mates who are smokers, and also depressive symptomatology. The above mentioned study also states that asthma and exposure to smoker friends were significantly associated with status of current smoking, and any attempt on the part of patient to quit smoking were found to be significantly associated with asthma and the depression spectrum. Study by Zbikowski et al. (2002) assessed the risk factors for smoking among adolescents with asthma (current or past) and came up with findings supporting the equivalent association of risk factors and current cigarette smoking for youth regardless of whether they were asthmatic or not and also the results did not differ for the current vs. past asthma. The study reports that adolescents with asthma were 1.5 times more likely to smoke than their peers without asthma.

### **Psychosocial conditions associated with smoking in adolescents with asthma**

A secondary analysis of the public-use data from the National Longitudinal Survey of Adolescent Health (Dowdell et al. 2011) shed some more light on this important health issue. Findings from the study indicated that the participants with asthma were more trying smoking (around 79%) as compared to those without asthma (75%;  $P < .05$ ). In addition, the study further reveals that the patients in the asthma group were more expected to later become smokers as compared to those in the non asthma group. The study results further substantiate the psychosocial theories refereeing to increased risk taking behaviour and impulsive inclinations during adolescents. A recent study attempted to quantify asthma disease severity and the associated comorbidities in paediatric population (5 to 18 years age) exposed to second hand smoke exposure and reported that Children with asthma exposed to such second hand exposure are very much likely to develop conditions like obesity and severe form of asthma as well (Pyle et al. 2015). A cross sectional survey of 608 asthmatic adolescents aimed to asses correlates of smoking among asthmatic adolescents, reported that 17.4% of the total participants were current smokers and 12.0% had history of smoking (Guo et al. 2010).

One of the point worth discussing in the above mentioned case report is the clearly evidenced lack of knowledge of the coach and the team authorities about the medical condition of the child. This appears to have delayed the medical procedures as well as initiation of treatment modules and management strategy by the attending physician, paramedic staff etc. Here it is important to discuss that teen agers and pediatric school going population suffering with asthma face multiple psychological blockage and various restrictions like necessity to take medicines in school, and most importantly the feeling of being tagged as 'sick' or 'diseased' by their peers which urges them to hide the status of their medical condition with most of their school mates, sports coach etc. This is a very crucial issue and needs to be attended by the school authorities and coaches on priority basis.

### **Recognizing and Management of asthma**

Nursing professionals need to assess and recognise the condition of a patient with asthma by some important approaches like asking patients a set of questions or by reviewing the self-assessment questionnaires of the patient. Some basic questions often discussed include assessing the status of the awareness of the patient regarding their routine, schedule, sleeping cycle, work/school related habits, number of visits to the healthcare providers, knowledge of the patient regarding their medication timing of the day etc. Nursing practitioners are very instrumental when giving education the adolescent and paediatric patients about the factors which may trigger asthma like irritants, allergens as well as

active/passive smoking. The role of nursing professional is also important in providing right education regarding use of inhalers and the technique involved.

### **Self management by the adolescents with asthma**

Self-management of the adolescents suffering from asthma is of prime importance as the caregivers may not be around the patients throughout the time at all places and localities. Here comes the role of having a self management approach (De Benedictis and Bush 2007). There are recommendations in form of an asthma action plan which are basically a set of instructions for the everyday self management tailored of the patient GINA (Global Initiative for Asthma 2015) and National Heart, Lung, and Blood Institute & National Asthma Education and Prevention Program 2007. An individual management plan of the patient can play very important role in disease treatment regimen adherence. Studies support the use of written, electronic as well as other forms of self management educational modalities. Collaborating with patient in order to understand the problems in following such management modalities may also be a good option to follow. The nursing professional should not forget to educate the patient and the care givers on good life style habits, treatment approaches in case of emergencies and also referral procedures to specialist of the given field. The above discussed case report gives a very important case scenario where all these points are to remembered by the healthcare providers.

### **Current Treatments of asthma**

Asthma is posing an important health problem despite several treatment modalities available specially in vulnerable groups like adolescents and pediatric population. The potential therapeutics are being investigated regularly by the scientific community to assess their role in improving treatment and better control of asthma. The combination drugs fluticasone propionate along with formoterol fumarate already received approval from European authorities. Also the long-acting anticholinergic bronchodilators have been reported to give promising and safe results in patients with symptomatic-persistent asthma. Tiotropium, which is delivered via the Respimat SoftMist inhaler is currently approved for treating chronic-obstructive-pulmonary disease. Other trial results have also been reported (Kerstjens et al. 2012, Ohta et al. 2015) The Global Initiative for Asthma guidelines currently recommend tiotropium add-on therapy as an additional treatment option at stages 4 and 5 in adult patients with a history of exacerbations but the same remains to be tested with evidence

and safety data in adolescents. The phosphodiesterase-4 inhibitors are roflumilast approved in the United States to treat severe exacerbations in cases of chronic-obstructive-pulmonary disease. Other than the above mentioned treatment regimens followed, anticytokines and CRTH2 antagonists serve a new treatment option for asthma though their efficacy and safety is still under research in various randomized controlled trials across various age groups.

## **Conclusions**

Asthma in adolescents exposed to smoking is a very serious highly condition requiring immediate mediate attention. Its important for a nursing professional worker to understand, recognize and assess the condition of any comorbidity or complexities associated with asthma along with initiating the step by step treatment modalities in the patients specially in vulnerable groups like pediatric population and adolescents. Other factors associated and warranting immediate importance are educating the school going children, school authorities, teachers and parents and encouraging psychological management modalities in the adolescents with asthma.



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