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Indoor Air Pollution: An Overlooked Link Between Smoking, Sleep Related Respiratory Distress and Cardiometabolic Risk

Poluição do Ar Interior: Uma Ligação Esquecida Entre o Fumo, a Dificuldade Respiratória Associada ao Sono e o Risco Cardiometabólico

Keywords: Air Pollution, Indoor; Cardiovascular Diseases; Metabolic Syndrome; Sleep; Sleep Apnea Syndromes; Smoking
Palavras-chave: Doenças Cardiovasculares; Fumar; Poluição do Ar em Ambientes Fechados; Síndrome Metabólica; Síndromes da Apneia do Sono; Sono

Recently, authors from a paper comparing the air quality in smokers' and non-smokers' bedrooms, using a multi-pollutant approach, found that several pollutants not only exceeded the limits defined by the national guidelines, but also that their concentrations were significantly higher in smokers' bedrooms.[1] This is an interesting and rather disturbing aspect that leads to more than a simple environmental-based reflection. It should actually be considered a broad range public health issue. Despite the generalized health related negative outcomes associated with indoor air pollution, it is perfectly established that air quality specifically affects the cardiorespiratory and metabolic functions thus increasing the risk of cardiorespiratory and metabolic disorders, both highly prevalent conditions among the general population with a non-negligible impact on mortality rates.[2] Impact of air quality on health acquires even a higher relevance during sleep since this fundamental state where humans spend about 1/3 of their lives is also a period of great physiological challenges, mainly regarding cardiovascular and metabolic functions. Furthermore, smoking - either actively or by means of passive exposure - is an independent risk factor for cardiometabolic risk.[3] On the other hand, environmental tobacco exposure is considered a major contributor to indoor air pollution by means of its toxicological substances, particulate matter, odor concentration and chemical composition.[4] This is directly related with persistent residue generated from aged secondhand smoke (thirdhand smoke) which was shown to impact immunity and to exacerbate respiratory symptoms *in vivo* experimental models. Tobacco may therefore act directly and/or indirectly (increasing air pollution) on cardiometabolic risk. Poor air quality is also associated with respiratory distress. Patients with previously compromised respiratory function often experience even more difficulties while breathing during sleep[5] which in turn may be perpetuated and aggravated by indoor air pollution.

In the aforementioned paper,[1] the authors further interestingly discussed the potential value of studying specific volatile organic compounds such as acetone, which is a product of human metabolism. Acetone is exhaled in higher amounts in patients with diabetes, a prevalent metabolic disorder which apart from the relevant clinical condition, may then, through this same mechanism, constitute a potential air pollution problem.

Hence, indoor air pollution can play a significant role as an intermediate effector of cardiometabolic risk associated with smoke and to sleep-related respiratory distress. Moreover, human breath can itself act as an important air pollution vehicle which in particular circumstances, may predispose to a vicious cycle through a deleterious role contributing also to an increased cardiometabolic risk (Fig. 1). In this context, indoor air quality should probably be considered more cautiously in the medical context, particularly when assessing smokers presenting with respiratory distress mainly related with sleep. This could be translated in a better clinical management in general but also in a better control of the respiratory disease.

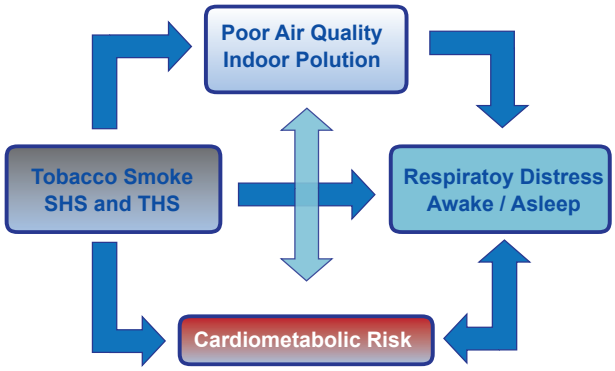

Figure 1 – Schematic representation of interactive dinamics between Poor Air Quality, Tobacco Smoke [including Secondhand smoke (SHS) and Thirdhand smoke (THS)], Respiratory Distress (while awaiking or asleep) and Cardiometabolic Risk

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How to Improve the Transition from Pediatric to Adult Health Care Services?

Como Promover o Processo de Transição de Cuidados Pediátricos para Medicina de Adultos?

Keywords: Adolescent Health Services; Pediatrics; Transition to Adult Care
Palavras-chave: Pediatria; Serviços de Saúde do Adolescente; Transição para Assistência do Adulto

We were recently challenged by the transfer of a patient with a previous diagnosis of craniopharyngioma and panhypopituitarism.

This adolescent patient was admitted to the internal medicine ward from the emergency department due to an altered level of consciousness. During the hospitalization, metabolic and infectious conditions were resolved. After the improvement of the patient's medical condition there was an evaluation in the Day Hospital and the medical team wondered about the best follow-up and referral appointments for this patient: pediatric care or adult care?

Advances in medicine have resulted in dramatic increases in the number of children and adolescents with chronic conditions.[1] Transition is formally defined as the purposeful, planned movement of adolescents with chronic medical conditions from child-centered to adult-oriented health care. This step can be challenging for young patients. A poor transition can result in increased morbidity and mortality as well as poor social and educational outcomes and high rates of loss to follow-up and non-retention in care.[2]

The goals of a planned health care transition are to improve the quality of life, maximize independence and minimize interruption in care as a patient moves from a pediatric to an adult sub-specialist.[3]

There are interesting tools to help clinicians understand when the best time is to perform this transition, such as ON Taking Responsibility for Adolescents/Adult Care (ON TRAC) or Transition Readiness Assessment Questionnaire (TRAQ).[4,5] Other tools to facilitate transition include joint newsletters, transition appointments involving both adult and pediatric providers, tours of adult facilities, and medical health summaries.[6]

The concept of a planned transition early in the life of a patient should be discussed at the appropriate time, allowing better management of expectations. The patient achieving adulthood is expected to become independent from his parents and become a functioning member of society.[6]

From a clinician point of view, it is essential to obtain a full history: past medical and surgical history, medications and supplements, social history (smoking, alcohol and drug use), exercise, diet, occupation/plans for the future and family history. A Review of Systems sheet that the patient fills out could be helpful for the first appointment.

There are plenty of barriers that could lead to an unsuccessful transfer—from hospital logistics to poor communication between pediatric and adult providers to parents who do not agree with the transfer.[6] The principal barriers to transition are lack of time and training.[3]

In our own experience, there is a great window of opportunity to improve the transfer of patients from pediatric care to adult care. Day Hospital is an interesting alternative to young patients and adolescents, which protects them from bad experiences in an adult ward. Clinicians should be more alert to this important subject and work as a team to successfully transfer patients from pediatric to adult care.

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