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## Adolescence: the last frontier

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There are three reasons why a child may die from an acute attack of asthma. First, treatment might be unavailable - typical in resource-poor areas, but common also in so-called affluent countries that seem to have erected financial barriers thereby depriving the impoverished of medical care for their children.<sup>1</sup> Secondly, the asthma attack may have come suddenly, and the child has died before medical attention can be summoned. And third, there may have been medical mismanagement of the attack itself. If a child with acute severe asthma is still alive when admitted to a hospital equipped with an intensive care unit, then survival should be virtually

guaranteed; deaths arise when the attack is mismanaged or the severity underestimated. However, it is clear that even with perfect medical management, some asthma deaths are unpreventable.<sup>2-9</sup> Thus, any childhood asthma death should teach us lessons, and these will vary with circumstances.

Lessons may be learned either from detailed examination of individual deaths or by reviewing large data sets, though each has its advantages as well as its problems. Large datasets may suffer from inaccuracies of reporting and a lack of details that might have been useful - in particular, even discrepant details may lead to fruitful lines of further

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enquiry. In this issue of the *Jornal de Pediatria*, Prietsch et al.<sup>10</sup> review asthma deaths in Brazil over a nearly 30-year period. They document a gratifying overall drop in mortality rates over that time period, albeit not to zero. Still, what can we learn from these data? They divide the children into three age segments (1-4, 5-9, and 10-19), and we suggest that deaths in each age group, in particular the discrepancies, are giving us different messages, and highlighting the need for different action points to drive down the death rates further.

The most dramatic decline in deaths is in the 1-4 year age group; the death rate in this classification has declined to about one third of initial values over the thirty-year period. However, before we all congratulate ourselves, it is worth reflecting that this is the age group in which there are the fewest therapeutic options! Thus, any evidence of benefit for the use of inhaled or nebulised corticosteroids to prevent attacks of episodic viral wheeze<sup>11</sup> (and indeed the use as treatment of oral, inhaled, or nebulised corticosteroids) is for the most part very scant.<sup>12-15</sup> So, it is unlikely that medications are the main reason for this dramatic improvement.

Part of the change may, of course, be related to diagnostic fashion, something that changes over time and is very difficult to correct for. However, much more likely, the authors suggest, it is improved delivery of care that is the likely cause for this decline - an unsurprising supposition in a country whose dynamic pursuit of attaining its millennium development goals has attracted such widespread admiration. Is it also possible that improvements in the home environment may have helped, may have raised standards of living thereby reducing the indoor pollution to which children are exposed? Another important factor might be improved antenatal health, for the potential impact on fetal lung health of reduced environmental tobacco smoke and other kinds of environmental pollution<sup>16,17</sup> has the capacity to produce lifelong benefits. It would also have been interesting, since both affect early respiratory health, to see whether the prevalence of prematurity and low birth weight have decreased over the same study period.<sup>18</sup> Of note, there is also no sign of leveling off in the fall in mortality rates, and further improvements in access to care, particularly at the time of acute attacks, can be anticipated to drive down the death rate even further.

There is also a gratifying near-halving of the death rate in the 5-9 year age group. In this segment of the population, an episodic viral wheeze commonly gives way to atopic asthma. But we know that inhaled corticosteroids are effective in improving baseline asthma control and reducing viral-induced asthma attacks.

The Finns have led the way in reducing asthma deaths in children by implementing a detailed program including: early diagnosis and active treatment, the use of guided self-management strategies,<sup>19,20</sup> attention to the environment (especially all forms of tobacco smoke exposure), patient education, rehabilitation, individually planned use of routine treatments, a general raising of knowledge of asthma, and research promotion. Which specific components of this program are most important is not yet clear and is actually less important than understanding that getting the basics right pays large dividends - a lesson Brazilians and the rest of the world have had to re-learn in the context of severe asthma.<sup>21,22</sup> So, although the steep fall in the 1-4 year age group death rate probably reflects positively on public health, the decrease in the 5-9 year age group reflects better pediatric care. Again, this is a work in progress, and more can probably be done, especially in resource-poor areas, although the present data do not allow an authoritative statement about this.

One note of caution is appropriate. The authors, Prietsch et al., also speculate that the increased use of long-acting  $\beta$ -2 agonists (LABAs) may have contributed to the reduction in the death rate in this 5-9 year age group. It is true that adult studies have shown a reduction in exacerbations by employing these medications, but the pediatric evidence is much less firm. There has also been non-evidence based "prescription creep," whereby combined therapy (LABA combined with inhaled corticosteroid) is increasingly replacing monotherapy with inhaled corticosteroid as a first line prophylactic therapy for pediatric asthma.<sup>23</sup> Although we are satisfied that LABA combined with inhaled corticosteroids is safe, the wounds of excess asthma deaths related to incautious and complacent  $\beta$ -agonist therapy are still too raw for us not to want to use these agents unless they are mandated - specifically if asthma is not controlled by appropriate doses of properly administered inhaled corticosteroids.<sup>24</sup> So, these observational data should not be used to drive the inappropriate prescription of LABAs.

Much more concerning, however, is the complete lack of impact on the death rate in adolescents as a result of this study. If the decrease in asthma-related deaths in pre-school and young school-age children is a result of improved delivery of care and better medications, then why has the adolescent population not reaped those benefits despite there being no evident difference in the airway inflammatory process from ages 5 through 19? This perhaps implies that, unlike in the younger children where more of the same is likely to produce on-going benefits, adolescents may need a different approach. We are all familiar with the problems of adolescence:

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risk-taking behavior, denial, poor adherence to rules and routines, and poor utilization of health care resources – to name but a few.<sup>25,26</sup> The data of Prietsch et al. importantly indicate that little progress has been made in this age group over the years, and it is perhaps likely that their figures are reflected worldwide. So, we need new approaches.

For example, might social media be used to improve adherence, or iPad-based consultations replace a trek to the hospital? There may also be the option of heightening parental awareness of the risks in this age group (although whether parents ever favorably impact the behavior of their adolescent children is questionable). The ideal of proper parental supervision of medications is desirable but likely unattainable for this age group in this or any other country. The World Health Organization and many others have done superlative service in delivering top quality, affordable asthma care to resource-poor areas. Now we need to find better ways of delivering care, not just to those who are resource-poor, but to those who deliberately distance themselves from the high quality resources that are available.

It would also be interesting to stratify asthma deaths over time according to disease severity to determine whether the fall in deaths is predominantly in those with a milder form of the disease. It has been revealed in a recent review of asthma deaths in the UK (between 2001-06) that 50% of such deaths were recorded in children with mild to moderate cases of the disease, and that these were likely precipitated (thereby confirming an Australian study)<sup>27</sup> by sudden allergen exposure.<sup>9</sup> From the evidence of other research, it is likely that the severity of the asthma was underestimated and there was persistent and on-going eosinophilic inflammation.<sup>28,29</sup> However, whatever the mechanism, the message is that one must not be complacent about so-called mild asthmatics. Indeed, every effort must be made to ensure appropriate treatment is prescribed, and adequate monitoring is in place, with the family fully committed to the process with an understanding that “mild” asthma and a benign prognosis are not necessarily synonymous. This is a major challenge to us all, for complacency toward a child’s “mild asthma” may lead literally to a fatal outcome.

So, Prietsch et al. have done us a great service by delineating the different changes in asthma death rates over various age groups. It would be nice to extend this work by seeing if there is any relationship to other trends, such as smoking. And indeed, as an ever more desperate tobacco industry exports more of their sinister product to the developing world, it will be important to see that these trends are not reversed. For the Star Ship Enterprise, space was the last frontier. We suggest, for pediatricians, it is adolescence, and that Captain Kirk had the easier mission!

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## Should we perform objective assessment of nasal obstruction in children with chronic rhinitis?

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Nasal obstruction is one of the most common symptoms in pediatric practice. Although a wide global variation in the prevalence of current chronic rhinoconjunctivitis symptoms has been reported, the overall prevalence appears to be about 15% for young adolescents.<sup>1</sup> An increase in several countries has been recorded in recent years, mostly in older age groups. The increase is more pronounced in low and mid-income countries.<sup>2,3</sup>

While acute viral infections constitute a daily problem, usually without diagnostic difficulties, "chronic rhinitis" is also a frequent diagnostic label. Diagnostic accuracy as well as determination of the degree of nasal obstruction in everyday pediatric practice, but also by ear, nose, and throat (ENT) specialists, primarily depends on the patient's – even the parents' – subjective description. Still, the complaint of a blocked nose can be a complex clinical problem involving mucosal, structural, and even psychological factors.<sup>4</sup> Thus, in several cases, an issue of reliability of the clinical information does exist, and verification is required.

In this issue of the *Jornal de Pediatria*, Mendes et al.<sup>5</sup> report on the correlation between subjective and objective assessments of nasal obstruction in children and adolescents with allergic rhinitis. The authors used both active anterior rhinomanometry for total nasal airway resistance measurement and acoustic rhinometry for each nostril separately. They found no correlation between objective and subjective measurements when the nasal cavity was assessed as a whole, but interestingly, a significant negative correlation between subjective obstruction score and nasal airflow resistance was detected when each nostril was individually assessed. These observations lead to a number of very useful clinical points that are worth commenting on.

According to the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines, clinical history is essential not only for an accurate diagnosis of rhinitis but also for the assessment of its severity.<sup>6</sup> Patients with allergic rhinitis suffer from sneezing, anterior rhinorrhea, and very often bilateral nasal obstruction. Nasal fullness is usually the most

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