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CASE REPORT

Another case of preventable death from asthma

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ABSTRACT

Introduction: Asthma prevalence is 262 million globally, with more than 1,000 deaths each day, most of them preventable. We were performing a longitudinal study, in Brazil, with the objective to following up patients who had a severe asthma attack and attended an emergency room (ATTACK Study). Here we present a case of a 28-year-old woman presenting what was considered moderate asthma, enrolled in ATTACK, who subsequently died of asthma.

Case Study: The patient was initially evaluated at an emergency room (ER) with uncontrolled asthma and no regular treatment. She had an asthma diagnosis just before this visit to the ER, despite presenting symptoms of asthma since childhood. She was subsequently evaluated by a specialist, who prescribed a treatment with regular inhaled corticosteroid and an inhaled bronchodilator, if necessary. The patient was systematically monitored by telephone for six months.

Results: The patient did not adhere to the treatment, in spite of repeated warnings, and 6 months later had an asthma attack resulting in her death.

Conclusion: It is important to prioritize asthma in primary health care, including building capacity health care professionals for early diagnosis, asthma management, and to educate patients with asthma patients for the identification of worsening and signs of severity, to manage the exacerbations according to a written asthma plan. This may reduce the number of premature and preventable asthma deaths.

Introduction

Asthma affects 262 million people worldwide, with more than 1,000 deaths each day, and many of them are preventable (1). The direct costs of the disease, social costs, and economic impact of asthma, across all age groups, have made it a major burden for health systems and families in low- and middle-income countries (2). It is estimated that there are 20 million people with asthma in Brazil (3,4), and about half are not diagnosed (5). In a study carried out with 109,104 school-aged individuals, asthma symptoms were observed in 23.2% of them, but only 12.4% had a confirmed diagnosis of asthma (5).

Although there is no cure, asthma is treatable and, in Brazil, inhaled corticosteroids and short-acting bronchodilators (SABA) are free of charge for the users of the public health system (6). Despite the wide access to essential medication, most of the patients do not have the proper pharmacological treatment for several reasons including underdiagnosis and poor adherence to controller treatment. The lack of adequate treatment is associated with risk of a more rapid decline in pulmonary function and worse outcomes of the disease, including the risk of death (7).

In this context, the ProAR (Programme for Control of Asthma in Bahia) Foundation, together with the National Institute for Health and Care Research (NIHR), implemented the ATTACK Study in Salvador, Brazil, with the objective of following up patients who had a severe asthma attack (SAA) and were assisted in an emergency room (ER), as well as training health care professionals to identify and treat asthma in primary health care in order to decrease the SAA recurrence. The study was approved by Ethics Committee

of Medical School of the Federal University of Bahia (Licence Number: CONEP n° 3.301.852, CEP 3.111.889) and registered in the Brazilian Registry of Clinical Trials (UTN: U1111-1236-3317). Here, we will present a case of a 28-year-old woman recruited by the ATTACK Study and diagnosed with moderate asthma (8), who died from an SAA possibly due to poor adherence to treatment leading to uncontrolled asthma symptoms.

Case study

The subject was evaluated at a public ER on March 17, 2020, complaining of shortness of breath, chest tightness, wheezing and coughing, which had happened once a month recently. She reported four visits to an ER in the last year and the use of antihistamines, prednisone and salbutamol to relieve symptoms, but no regular treatment for asthma. At the time, treatment with hydrocortisone intravenous (IV), nebulization with ipratropium bromide and fenoterol, aminophylline IV and adrenalin IM were given by the ER medical team. She was discharged home with prescription of prednisone, salbutamol, amoxicillin and clavulanate.

Eight days later, the patient was enrolled by ProAR, as a participant of the ATTACK Project. On examination, she showed general good condition, her oxygen saturation was 98%, blood pressure 100×70 mmHg, body mass index 30,4 kg/m^2, normal lung auscultation (with a respiratory rate of 24 breaths/min) and normal cardiac sounds and rhythm (heart rate of 66 beats/min).

The patient reported symptoms of asthma since childhood that were worsened with exposure to aeroallergens and sudden weather changes, however she was only diagnosed with asthma at age 28-years, just before the last ER visit.

Her asthma symptoms were not controlled according to the GINA (2018) and ACQ-6 scores (9), there was also a report of home exposure to house dust, with worsening of the symptoms. The patient had moderate-to-severe rhinitis, with persistent symptoms and no treatment. She denied the presence of other illnesses and allergies. The specialist at ProAR prescribed inhaled Beclomethasone 400 mcg twice a day, an inhaled bronchodilator (Salbutamol) when necessary and nasal Budesonide 50 mcg in each nostril twice a day. In addition, she received a booklet (https://repositorio.ufba.br/handle/ri/32849) guiding the management of asthma and guidelines from a respiratory nurse involving disease management and proper use of the inhaler device (10). Complementary tests (including spirometry and peak expiratory flow) were not performed due to the COVID-19 pandemic situation.

Results

According to the ATTACK protocol, the patient would undergo telemonitoring at regular intervals for one year. Over the course of six months, three telephone contacts were made, in which the patient reported not using the prescribed medication regularly and had uncontrolled asthma symptoms. She had a slight improvement in her symptoms when using Beclomethasone but did not keep the treatment in the proper way and the symptoms worsened again. On October 6, 2020, the patient had mild symptoms of asthma upon waking up, which worsened throughout the day, but did not attend an ER. At the end of the day, her dyspnea worsened further, and she decided to go to the ER, however, she suffered a cardiorespiratory arrest while on a taxi in the way, resulting in death. No symptoms of COVID-19 had been reported.

Discussion

This patient is a classic case of preventable death from asthma. In an audit carried out with 276 cases reviewed in the United Kingdom, 195 (71%) were deaths caused by asthma attacks, and, of these, 58% of the individuals were presumed to have mild or moderate asthma based on treatment prescribed. In addition, 45% of these patients (87 cases) died before seeking medical care or before care could be provided and 57% (112 cases) of the registered deaths had no follow-up with a specialist in the last 12 months (11). Our patient reproduced all these unfortunate circumstances besides the very late diagnosis of asthma and being non-adherent to the treatment with inhaled corticosteroids (ICS).

The current definition of asthma severity is based on clinical history after at least 2-3 months of asthma treatment, and moderate asthma can be defined as controlled symptoms with low- or medium-dose ICS-LABA (Long-acting beta-agonist) plus as-needed SABA (8). Despite the four visits to an ER in the last 12 months, our patient was only diagnosed with asthma just before the last visit and did not have a prescription for regular treatment, therefore it is difficult to classify using this retrospective definition. After visitation at ProAR, she had a slight improvement in her symptoms when using medium-dose of

ICS (Beclomethasone 800 mcg/day), however, with the poor adherence to the regular treatment, her symptoms worsened again. It is important to note that patients with mild or moderate asthma can still have severe or fatal exacerbations, as happened to our patient, and SABA-only treatment, without any regular treatment with ICS, increases that risk (8).

There is plenty of evidence the use of ICS is beneficial to prevent the decline of pulmonary function and deaths (7,12,13). In the ProAR experience, after four years of distribution of ICS units, the number of hospitalizations by asthma attacks was reduced in 74% in the entire City of 3 million inhabitants, Salvador (13). Nevertheless, asthma mortality is still over 2,000 deaths a year in Brazil (3). This number could be reduced by the implementation of a national action plan for asthma control in the country, with special attention on building capacity of primary health care teams and patient's education. The Finnish National Asthma Programme, for instance, was able to reduce the rate of patients with severe and uncontrolled asthma. In 1994, at the start of the Finnish asthma program, it was estimated that 20% of the patients had severe or uncontrolled asthma and, by 2010, this number reduced to 4%, the annual asthma costs diminished significantly and the number of patients receiving maintenance medication, mainly ICS, tripled (14). They highlight that besides the early diagnosis and pharmacologic therapy, to prevent uncontrolled asthma symptoms is important to include the patient education in the clinical routine (15).

The ATTACK protocol includes the patient's continued education during the telemonitoring, mainly the importance of adherence to the pharmacological treatment. Despite the alerts, the patient did not take the ICS doses regularly, probably because she underestimated her symptoms or the need to use medication daily even in the absence of symptoms. However, asthma is a chronic disease and airway inflammation is present even when the disease is clinically silent, therefore, the ICS treatment should be continuous (8,12).

A long with the patient's education, primary care professionals should be trained as well to identify the symptoms and prescribe the treatment properly. Primary care clinicians are consulted by patients with several medical conditions, and it is a challenge to perform an accurate diagnosis without specialized investigations. Besides, asthma is a variable condition and spirometry, which is a very helpful test to confirm the diagnosis, most of the time, is not accessible in primary care (16). Our patient reported asthma symptoms since childhood and had had several visits to ER before her diagnosis at 28 years old. In addition, her asthma was treated as an acute and not a chronic disease at the primary care units since she only received a prescription for bronchodilators during the ER visits, and the treatment with ICS was only recommended by ProAR, a specialized service on asthma. It is important to highlight that is possible to treat asthma at the primary care level, except for cases of severe and difficult-to-treat asthma (16), which reinforces the importance of healthcare professionals trained to perform the proper management.

It is worth to note that our patient underestimated the severity of her problem, resulting in poor adherence to inhaled corticosteroids and a delay to seek for help. In the study of Vanegas et al. (2020), 30% of Latin American asthma patients showed this behavior (alexithymia), and they were more likely to have their disease uncontrolled (17). It reinforces the importance of a continued education of asthma patients for them be able to identify their symptoms and manage the disease through an individualized action plan including a visit to the emergency unit when necessary.

Conclusion

Thus, it is crucial to implement a national action plan for asthma control to reduce the burden of asthma in Brazil, which may be the case in many other low- and middle-income countries, including training primary healthcare professionals to perform an early diagnosis and correct asthma management, besides continued patient education and considering all cases of asthma as potentially serious, as it can lead to death regardless of the severity classification. Perhaps, given the necessary priority, we may follow Finland's example and eradicate asthma deaths in the country.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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References

1. The Global Asthma Report. The global asthma report 2022. Inter J Tubercul Lung Dis 2022;26:1–104.

2. Cruz ÁA, Stelmach R, Ponte E v Asthma prevalence and severity in low-resource communities. Curr Opin Allergy Clin Immunol 2017;17:188–193. doi:10.1097/ACI.0000000000000360.

3. Global Asthma Network. The global asthma report 2018. 2018. www.globalasthmanetwork.org

4. Pearce N, Aït-Khaled N, Beasley R, Mallol J, Keil U, Mitchell EA, Robertson MI, Björkstén B, C, Anderson HR, Asher, et al. Worldwide trends in the prevalence of asthma symptoms: phase III of the International Study of Asthma and Allergies in Childhood (ISAAC). Thorax 2007;62:758–766. doi:10.1136/thx.2006.070169.

5. Barreto ML, Ribeiro-Silva R de C, Malta DC, Oliveira-Campos M, Andreazzi MA, Cruz AA. Prevalence of asthma symptoms among adolescents in Brazil: national Adolescent School-based Health Survey (PeNSE 2012). Rev Bras Epidemiol 2014;17:106–115. doi:10.1590/1809-4503201400050009.

6. Ministério da Saúde - Brasil. Relação Nacional de Medicamentos Essenciais: rename 2020 [recurso eletrônico]. 2020. p. 1–217. http://portalms.saude.gov.br/assistencia-farmaceutica/medicamentos-rename

7. Kanemitsu Y, Matsumoto H, Mishima M. Factors Contributing to an Accelerated Decline in Pulmonary Function in Asthma. Allergol Inter 2014;63(2):181–188. doi:10.2332/allergolint.13-RA-0670.

8. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2023. www.ginasthma.org

9. Juniper EF, O'Byrne PM, Guyatt GH, Ferrie PJ, King DR. Development and validation of a questionnaire to measure asthma control. Eur Respir J 1999;14(4):902–907. doi:10.1034/j.1399-3003.1999.14d29.x.

10. De Matos Magalhães B, Barbosa C, Santos S, Pimentel G, Das Cha-Gas P, Carla A, Coelho C, De Souza-Machado C, Souza ÁA, Filho C. Development of an educational booklet for adults with asthma: an expe-rience report.Int J Innov Educ Res 2022;10:89–97. doi:10.31686/ijier.vol10.iss10.3953.

11. Royal College of Physicians (RCP). Why asthma still kills: the National Review of Asthma Deaths (NRAD) Confidential Enquiry report. London: RCP; 2014.

12. O'Byrne P, Fabbri LM, Pavord ID, Papi A, Petruzzelli S, Lange P. Asthma progression and mortality: the role of inhaled corticosteroids. Eur Respir J 2019;54:1900491. doi:10.1183/13993003.00491-2019.

13. Souza-Machado C, Souza-Machado A, Franco R, Ponte E v, Barreto ML, Rodrigues LC, Bousquet J, Cruz AA. Rapid reduction in hospitalisations after an intervention to manage severe asthma. Eur Respir J 2010;35:515–521. doi:10.1183/09031936.00101009.

14. Haahtela T, Herse F, Karjalainen J, Klaukka T, Linna M, Leskelä RL, Selroos O, Reissell E. The Finnish experience to save asthma costs by improving care in 1987-2013. J Allergy Clin Immunol. 2017;139:408–414.e2. doi:10.1016/j.jaci.2016.12.001.

15. Burki TK. Asthma control: learning from Finland's success. Lancet Respir Med 2019;7:207–208. doi:10.1016/S2213-2600(19)30030-X.

16. Levy ML, Bacharier LB, Bateman E, Boulet L-P, Brightling C, Buhl R, Brusselle G, Cruz AA, Drazen JM, Duijts L, et al. Key recommendations for primary care from the 2022 Global Initiative for Asthma (GINA) update. Npj Prim Care Respir Med. 2023;33:7. doi:10.1038/s41533-023-00330-1.

17. Vanegas E, Felix M, Ramon GD, López Jove O, Matos Benavides EE, Tinoco-Morán I, Bernstein JA, Cherrez-Ojeda I. Influence of alexithymia on the management of Latin American patients with asthma: a cross-sectional study. SAGE Open Med. 2020;8:205031212093091. doi:10.1177/2050312120930913.