Journal of african clinical cases and reviews / Journal africain des cas cliniques et revues

www.jaccrafrica.com ISSN 1859-5138 Open access

Clinical case

Occupational asthma in an irrigation system installer: a case report

Asthme professionnel chez un installateur de systèmes d'irrigation : à propos d'un cas

AS Sagna*[1], MD Ndour[2], MTA Fall[3]

Résumé

Introduction : L'asthme professionnel est une composante du groupe des asthmes en relation avec le travail aux côtés des asthmes aggravés par l'activité professionnelle. Les phénomènes irritatifs répétés aboutissant à une sensibilisation par les cellules immunitaire sont aujourd'hui admis comme mécanisme en cause dans la genèse de cet asthme professionnel. Nous rapportons un cas dans une entreprise spécialisée dans la conception et la réalisation de systèmes hydrauliques. Un homme de 46ans, installateur de systèmes d'irrigation a consulté 9ans après son embauchage pour une dyspnée expiratoire. Le diagnostic d'un asthme a été retenu puis un traitement mis en route sans aménagement et sans modification de ses conditions de travail. Ayant remarqué la rythmicité des crises de dyspnée avec certains travaux, le travailleur s'en retirait volontiers ce qui amena l'employeur à demander un avis médical. Le diagnostic d'asthme professionnel a ainsi été posé et une prise en charge considérant son milieu de travail instaurée. Conclusion : Le diagnostic clinique de l'asthme est facile. La méconnaissance de son origine professionnelle provoque un échec thérapeutique et altère la qualité de vie du travailleur. Les entreprises exposant à des poussières particulières devraient instaurer une spirométrie de surveillance en accompagnement de toutes les autres mesures.

Mots-clés : asthme professionnel, installateur, irrigation, respiratoire, Sénégal.

Abstract

Introduction: Occupational asthma is a component of the group of work-related asthmas alongside asthma aggravated by occupational activity. Repeated irritative phenomena leading to sensitization by immune cells are now accepted as the mechanism involved in the genesis of this occupational asthma. We report on a case in a company specialized in the design and manufacture of hydraulic systems. A 46-year-old man, an irrigation system installer, consulted 9 years after being hired for expiratory dyspnea. The diagnosis of asthma was retained and treatment was initiated without any adjustment and without any change in his working conditions. Having noticed the rhythmicity of the dyspnea attacks with certain jobs, the worker willingly withdrew from

them, which led the employer to seek medical advice. The diagnosis of occupational asthma was thus made and a management based on the work environment was introduced.

Conclusion: The clinical diagnosis of asthma is easy. Lack of knowledge of one's professional background causes therapeutic failure and alters the worker's quality of life. Companies exposed to particular dusts should implement monitoring spirometry in conjunction with all other measures.

Keywords: occupational asthma, installer, irrigation, respiratory, Senegal.

Introduction

Occupational asthma refers to asthma developed as a result of repeated, long-term exposure to substances known to cause asthma, as well as asthma of sudden onset following massive exposure. [1]. This asthma is part of the group known as work-related asthma (WRA), which includes not only de novo asthma, but also asthma aggravated by work activity [2], [3].

The mechanisms hitherto accepted for occupational asthma are sensitization by immune cells, as in classical asthma, and inflammation phenomena due to irritant mechanisms [1], [3], [4]. In the occupational environment, multiple exposures and the insidious nature of its development may lead to a misunderstanding of the occupational origin of allergic asthma induced after sensitization to an occupational agent. We report a case of occupational asthma in a company specializing in the design and manufacture of hydraulic systems, particularly in the agricultural and water treatment sectors.

Clinical case

The patient was a 46-year-old non-smoker with no particular pathological history, working as an irrigation system installer for a company specializing in irrigation systems. His job included preparing irrigation systems for installation and testing their operation. This preparation involved handling PVC pipes with buckling, using PVC glue with thinner, and applying paint. The patient presented with dyspnoea accompanied by coughing during periods of field work, which tended to disappear during vacations or inter-campaign periods (off-peak periods with no field activities), 09 years after recruitment. This symptomatology worsened with episodes of severe dyspnea, prompting a visit to the emergency department, where, on the basis of clinical findings, a diagnosis of asthma was made and long-term treatment instituted. Eight years after this clinical diagnosis, the worker was referred to us by his employer for a fitness-to-work check-up. He had withdrawn from the tasks he had identified as triggering his dyspnoea attacks.

Spirometry was performed (before and after bronchodilation) and confirmed the diagnosis of asthma. An occupational investigation revealed occupational exposure to polyvinyl chloride pyrolysis fumes, organic isocyanates and methyl methacrylates, improvement during rest periods and vacations, and a recrudescence and aggravation of symptoms with field work. The diagnosis of occupational asthma of allergic mechanism was retained.

We have declared this asthma as an occupational disease under Table 38 of Senegal's occupational diseases.

A workstation reorganization was proposed, with a ban on exposure, reinforced collective preventive measures and special medical surveillance for all colleagues subject to the same exposures.

Discussion

Asthma is thought to be the most common occupational respiratory disease [5]. However, it is under- diagnosed and under-reported, according to several studies [1], [5]-[7]. In the workplace, asthma can occur following a single massive exposure as part of the Brooks syndrome or following repeated exposure to low doses. [1], [8], [9]. In the event of massive, usually accidental, exposure to a chemical

component, hyperreactivity of the bronchial mucosa can occur, giving rise to an asthmatic manifestation known as the reactive airways dysfunction syndrome described by Brooks in 1985 [10]. This asthma manifests itself within 24 hours of exposure, with a picture dominated by coughing, nasal obstruction, retrosternal pain and dyspnoea; it then lasts at least three months in a patient with no history of respiratory disease. [4], [8], [10], [11]. Respiratory function tests revealed an obstructive syndrome and bronchial hyperreactivity. The diagnosis was then based on the Brooks criteria [4], [11]:

- No history of lung disease
- Onset of symptoms after a single exposure or after an accident.
- Exposure to irritating gas, fumes or vapors in high concentrations.
- Onset of symptoms within 24 hours of exposure and lasts at least 3 months.
- Symptoms are reminiscent of asthma, with cough and sibilant dyspnea.
- Respiratory function tests may show an obstructive syndrome and/or a positive meta-choline test.
- Other lung diseases have been eliminated.

These same criteria have been revised and adapted. Indeed, the definition of brooks excluded from the outset known atopic patients [1], [12].

In the case of repeated exposure to low doses but prolonged over time, sensitization by high-molecular- weight particles leads to massive production of IgE antibodies or, more rarely, low-molecular-weight particles, the mechanism of which is poorly understood. [9], [10]. The latency period of this asthma can last from several weeks to several months. It is an allergic occupational asthma [2], [13], [14] often accompanied by chronic rhinoconjunctivitis [10]. Diagnosis, in addition to respiratory function tests, is based on specific IgE assays, improvement in symptoms on rest days, and recurrence after each new exposure.

In our case, the imputability of the asthma to the profession was established 08years after the disease was first diagnosed. This led to continued exposure and probable aggravation of the disease. [4]. This long delay may have been due to the failure of health professionals to pursue etiological research in chronic pathologies, thus failing to recognize an occupational origin. [7] companies with no occupational medicine department, and workers' lack of awareness of the possibility of declaring their illness. [7]. In Tunisia, Amira Omrane found that only 8.5% of occupational asthma cases were reported by general practitioners, and 10.5% by pulmonologists, even though they were the ones who first diagnosed the disease [15]. The consequences of this pathology for our worker were a conflict with his employer due to his withdrawal from the activities he was incriminating, the cost of treatment and regular visits to emergency services. These not inconsiderable consequences are also described by Pascal Andujar [2] and testify to the negative impact that this pathology can have if its imputability to the profession is not established [4], [16]. Complete and definitive eviction has been chosen in the face of this picture, as proposed by several authors [10], [17].

The declaration was made under table 38 of Senegal's occupational diseases as 4.3% of all occupational diseases declared in Senegal. [18]. Unlike Tunisia, where Table 43 of occupational diseases specifically mentions polyvinyl chloride pyrolysis fumes as a cause of occupational asthma [6] the Senegalese table on its indicative list does not specify this particular substance. Tunisia has a restrictive list of jobs likely to cause occupational diseases, whereas Senegal's list is indicative, offering flexibility in reporting.

Conclusion

Occupational asthma is a reality in Senegal. Clinical diagnosis of the condition is easy, but failure to recognize its occupational origin has deleterious socio-professional and economic consequences, and can lead to continued occupational exposure, resulting in treatment failure and worsening over

time. Whether asthma is irritant or allergic in origin, early diagnosis and identification of its occupational cause are the key to better health and productivity. In any case, primary prevention requires all company managers to be aware of and avoid exposure to dust; secondary prevention calls for special medical surveillance for early diagnosis of respiratory pathologies; and tertiary prevention calls for optimal medical care and adaptation or change of workstation..

***Correspondence**

Assega Sylvain Sagna

sagna.assega-sylvain@ugb.edu.sn

Available online : January 4, 2024

1 : Société de Cultures Légumières (SCL), km2 Route de Diama, Saint-Louis, Senegal
2 : International Committee of the Red Cross
3 : West Africa Farms (WAF), Yamane, Louga Senegal

Conflict of interest : None

References

[1] J.-D. Dewitte, « Les asthmes professionnels en France et le syndrome de Brooks », Bull. Académie Natl. Médecine, vol. 201, no 7, p. 1137-1148, sept. 2017, doi: 10.1016/S0001-4079(19)30380-2.

[2] C. Gautier, M. T. Lecam, S. Basses, J. C. Pairon, et P. Andujar, « Définition de l'asthme en relation avec le travail et ses conséquences sociales et professionnelles chez l'adulte et l'adolescent », Rev. Mal. Respir., vol. 38, no 9, p. 914-935, nov. 2021, doi: 10.1016/j.rmr.2021.09.006.

[3] J. Hsinet et al., « L'asthme professionnel et l'asthme aggravé par le travail. Quelles différences en termes de facteurs de risque et d'aptitude au travail ? », Rev. Fr. Allergol., vol. 62, no 5, p. 462-469, sept. 2022, doi: 10.1016/j.reval.2021.09.003.

[4] O. Vandenplas, H. Suojalehto, et P. Cullinan, « Diagnosing occupational asthma », Clin. Exp. Allergy, vol. 47, no 1, p. 6-18, 2017, doi: 10.1111/cea.12858.

[5] « Asthme professionnel : profil clinique et professionnel du travailleur asthmatique tunisien », Rev. Pneumol. Clin., vol. 72, no 4, p. 228-233, août 2016, doi: 10.1016/j.pneumo.2016.03.003.

[6] A. Ayadi et al., « Asthme professionnel aux "produits de pyrolyse du polychlorure de vinyle monomère" : à propos d'un cas », Rev. Fr. Allergol., vol. 62, no 3, p. 365-366, avr. 2022, doi: 10.1016/j.reval.2022.02.185.

[7] M. Ndiaye, J. Ameille, et M.-L. Sow, « L'asthme professionnel dans un pays africain sub-saharien : le Sénégal », Rev. Fr. Allergol., vol. 51, no 8, p. 669-674, déc. 2011, doi: 10.1016/j.reval.2011.05.007.

[8] F. de Blay, « Asthme professionnel induit par les irritants », Rev. Fr. Allergol., vol. 51, no 3, p. 315-317, avr. 2011, doi: 10.1016/j.reval.2011.02.006.

[9] P. Maestrelli, P. K. Henneberger, S. Tarlo, P. Mason, et P. Boschetto, « Causes and Phenotypes of Work-Related Asthma », Int. J. Environ. Res. Public. Health, vol. 17, no 13, Art. no 13, janv. 2020, doi: 10.3390/ijerph17134713.

[10] S. M. Tarlo et C. Lemiere, « Occupational Asthma », N. Engl. J. Med., vol. 370, no 7, p. 640-649, févr. 2014, doi: 10.1056/NEJMra1301758.

[11] S. M. Brooks, M. A. Weiss, et I. L. Bernstein, « Reactive Airways Dysfunction Syndrome (RADS): Persistent Asthma Syndrome after High Level Irritant Exposures », Chest, vol. 88, no 3, p. 376-384, sept. 1985, doi: 10.1378/chest.88.3.376.

[12] E. J. Bardana, « Reactive airways dysfunction syndrome (RADS): guidelines for diagnosis and treatment and insight into likely prognosis »,

Ann. Allergy. Asthma. Immunol., vol. 83, no 6, p. 583-586, déc. 1999, doi: 10.1016/S1081-1206(10)62876-1.

[13] S. Hulo, E. Dalle, J.-L. Edmé, A. Sobaszek, et V. de Broucker, « Asthme professionnel ou asthme aggravé par le travail : comment faire le diagnostic ? », Rev. Fr. Allergol., vol. 59, no 3, p. 227-229, avr. 2019, doi: 10.1016/j.reval.2019.02.220.

[14] X. Muñoz, M. Cruz, V. Bustamante, J. Lopez-Campos, et E. Barreiro, « Work-Related Asthma: Diagnosis and Prognosis of Immunological Occupational Asthma and Work-Exacerbated Asthma », J Investig Allergol Clin Immunol, vol. 24, 2014.

[15] A. Omrane et al., « Asthme professionnel indemnisé dans le centre tunisien: étude ransversale sur huit ans », Pan Afr. Med. J., vol. 26, p. 164, mars 2017, doi: 10.11604/pamj.2017.26.164.11486.

[16] P. Thoré et A. Tiotiu, « Asthme professionnel non contrôlé : autour des comorbidités de l'asthme », Rev. Mal. Respir., vol. 36, no 5, p. 633-637, mai 2019, doi: 10.1016/j.rmr.2019.03.008.

[17] H. Janah, W. El Khattabi, N. Souki, A. Aichane, et H. Afif, « Profil étiologique et clinique de l'asthme professionnel à Casablanca : à propos de 99 cas », Rev. Mal. Respir., vol. 32, p. A59, janv. 2015, doi: 10.1016/j.rmr.2014.10.426.

[18] M. Ndiaye, T. Niang, M. M. Soumah, S. A. Dia, M. C. Gaye Fall, et M. L. Sow, « Les maladies professionnelles au Sénégal : état des lieux et perspectives », Arch. Mal. Prof. Environ., vol. 75, no 6, p. 584-589, déc. 2014, doi: 10.1016/j.admp.2014.07.059. .

To cite this article :

AS Sagna, MD Ndour, MTA Fall. Occupational asthma in an irrigation system installer: a case report. Jaccr Africa 2024; 8(1): 65-69