Journal of Clinical Respiratory: Open Access

The TSANZ Position Paper on Respiratory Surveillance: Even One Case of Pneumoconiosis is Too Much?

Debora H Yates*

Department of Thoracic Medicine, St Vincent's Hospital, Sydney, Australia

Editorial Note

Received: 26-April-2022, Manuscript No. JCROA-22-61849; **Editor assigned:** 29-April-2022, Pre QC No. JCROA-22-61849 (PQ); **Reviewed:** 13-May-22, **QC No.** JCROA-22-61849;
Revised: 20-May-2022, **Manuscript No.** JCROA-22-61849 (R); **Published:** 27-May-2022, DOI: 10.4172/jclinresp.4.2.002

***For Correspondence:** Debora H Yates, Department of Thoracic Medicine, St Vincent's Hospital, Sydney, Australia

E-mail: deborahy88@hotmail.com

Keywords: Silicosis; Dust-related diseases; Respiration; Coal-mining

ABSTRACT

Over the last 10 years, there has been a resurgence of dust-related lung diseases in Australia. This includes coal workers pneumoconiosis (CWP, otherwise known as black lung), silicosis, and a new rapidly progressive form of silicosis, engineered (or Artificial) Stone (AS) silicosis. These diseases are completely preventable and should not be occurring in the 21st century. This has prompted action among respiratory and occupational physicians, resulting in the publication of new recommendations on respiratory health surveillance and the establishment of a National Taskforce on Dust Diseases. While controlling respirable dust exposure is the foundation of primary and secondary prevention against dust-related diseases, identification of workers with early disease helps to prevent severe disablement and death and enables real world feedback on workplace dust control measures. The suggestions for improvements in respiratory surveillance include an overall reduction in occupational dust levels, better recording of dust exposures, enhanced surveillance testing, improved data collection and interpretation, and the establishment of a national harmonised system. These measures are designed to improve health outcomes for workers in the coal mining and artificial stone industries as well as other sectors where dust exposure occurs.

EDITORIAL NOTE

What is the problem?

Since the early 2000s, there has been a worrying resurgence of dust-related lung diseases worldwide, and particularly in Australia. These diseases had previously been assumed obsolete, but in reality were simply being

overlooked. The programs used to detect them had fallen into disrepair and no one believed that a problem still existed.

The pneumoconiosis are chronic fibrotic lung diseases produced by inhaling mineral dust or dusts (pneumo-lung; koniosis=dust). These include Coal Workers' Pneumoconiosis (CWP) or "black lung" and silicosis [1-3]. Many severe cases of these diseases have recently been described in Australia for the first time in over 40 years [4,5], including a new type of accelerated silicosis in Artificial Stone (AS) kitchen and bathroom bench-top workers[6,7]. These have occurred in many men at the height of their working lives, producing much disability and distress, and sadly also several completely preventable deaths.

Artificial (or engineered stone) silicosis is a type of silicosis which was first described in Europe and for the first time in Australia in 2014 [6]. This type of silicosis seems to progress more rapidly than other types. It arises in workers exposed to high levels of crystalline free silica and dusts released from artificial stone when these are cut and polished during the fitting kitchen and bathroom bench-tops. Such workers had been cutting stone dry, a practice known to be dangerous for many years, and without using any dust reduction measures or respiratory protection. The industry seemed to be ignorant of the risks. The result was many hundreds of workers, some in their 20s, developed silicosis. The rate at which these cases will be detected and progress to require lung transplantation, and the overall burden of such disability is not yet known, but is likely to be high. It is concerning also that, in addition to pneumoconiosis, silica exposure also causes several other lung diseases including pulmonary fibrosis, chronic bronchitis and emphysema, and lung cancer [2,8].

These cases of pneumoconiosis have recurred due to a widespread failure of regulatory controls in a situation where the medical evidence is very well established. Many failures have been identified, including deficiencies in dust control even in industries where lung health is notoriously at risk e.g. in the mining industry, failure to recognise disease when it occurred, and administrative difficulties within respiratory surveillance programs [9]. It is obvious that introduction of new products such as artificial stone occurred without adequate appreciation of likely hazards. This was compounded by lack of labelling, inadequate respiratory protection, and widespread complacency about dust control measures. Workers were unaware of any potential hazard, due to poor or absent education about risk. Also, they did not appreciate the fact that symptoms occur only very late in these diseases, and can be insidious. Thus, the situation was very different from most workplace hazards which often occur quickly (e.g. industrial accidents). Many workplaces were non-unionised, and workers often came from non-English speaking backgrounds, sometimes being imported into the country specifically to work in the building sector. The fact that cases of severe disease were only discovered in tertiary care rather than at source is a poor reflection on a system where methods of prevention of silicosis (including respiratory surveillance) have been known about for over 100 years.

In addition to pneumoconiosis, dust exposure is related to systemic connective tissue diseases [2,8,10-12], tuberculosis and fungal diseases. Renal dysfunction has also been described. The incidence of autoimmune disease in workers with artificial stone exposure is unknown but is likely to be significant; in one study, up to a third of workers had positive auto-antibodies induced by their artificial stone exposure [13]. These events are a stark reminder that occupational lung diseases are still a real issue and that continued vigilance by all is needed to diagnose and prevent them in the future.

What needs to be done?

The primary management of the pneumoconioses has always been to reduce or stop dust exposure. This slows the rate of progression of disease and increases time from exposure to development of symptoms (or disease latency) [1,3,14]. This has been the rationale for respiratory surveillance programs, which involve regular assessment of a worker's respiratory health every few years (or "periodically"). These usually involve a questionnaire, spirometry, and chest X ray. Such preventive programs have been the cornerstone of the reductions in incidence of pneumoconiosis in most developed countries and are compulsory for workers exposed to toxic dusts in many (but not all) countries [15].

Because members of the respiratory community were concerned by the resurgence of such diseases, the Thoracic Society of Australia and New Zealand (TSANZ) developed recommendations aimed at controlling coal mine lung dust diseases in 2016, with a detailed proposal for enhanced respiratory surveillance in late 2020 [16]. TSANZ suggested standardisation of coal dust exposure limits in all states and a reduction in legislated occupational exposure standards (which were in general significantly lower internationally than in Australia). We also proposed a standardised national surveillance program for at-risk workers. Following media interest and political support, the Federal government established a National Taskforce for Dust Diseases, to establish a national approach to the prevention, early identification, control and management of occupational dust in Australia [17].

TSANZ reviewed the evidence regarding respiratory surveillance programs for pneumoconiosis and prepared an evidence based Position Paper. Respiratory surveillance programs had been largely based on the World Health Organisation recommendations from the late 1970s [15]. Respiratory medicine has advanced hugely since those times, enabling detection of much earlier disease, with modern CT scans providing excellent visualisation of lung anatomy at much lower radiation doses than before, and clearly much superior to chest radiographs. Global initiatives had standardised lung function measurement and reporting, and the gathering, storage and analysis of data had been revolutionised.

In its Position Paper, the TSANZ recommends bringing respiratory surveillance into the 21st century (Table 1). In addition to better exposure data for each individual, periodic assessments of respiratory health should be performed using a standardised format and high quality, standardised CT imaging used as well as modern full lung function assessment. This is achievable even in remote locations by the use of mobile equipment such as lung buses which contain both CT scanning and lung function equipment [18], and by improved IT systems. Information gathered from enhanced respiratory surveillance should be stored in a centralised database, ideally a national repository funded indefinitely into the future. Such a register would enable detailed analysis of the burden of disease in each state, with changes in numbers of cases providing an early indication of inadequate dust levels. However, it should be borne in mind that these diseases are long latency diseases i.e. there would be at least a 20 year lag between exposure and detectable disease. Thus, it will take many years before the results of reduced occupational dust levels can be confirmed by zero cases of work-related lung diseases detected by respiratory surveillance.

Improved respiratory surveillance is designed to prevent disease and ensure a healthy, productive workforce. The detection of early disease should advance workers' respiratory health, and should also be an opportunity to

encourage smoking cessation among other preventive practices. Workers need however to be protected by suitable legislation from loss or downgrading of employment, and moved alternative jobs at equivalent salaries if disease is identified. Protection of workers' health is already an obligation on the employer, but this needs to be implemented in its fullest sense, with a firm commitment towards long term workplace health and safety. It is only with continued commitment from all, and awareness of these problems, that the scourge of pneumoconiosis can be put to rest.

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