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AN OVERVIEW OF CONTACT DERMATITIS RELATED TO OCCUPATIONAL CAUSES IN RECENT YEARS

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ABSTRACT

Occupational skin diseases, including allergic contact dermatitis and irritant contact dermatitis, have been commonly reported across various types of occupations. Although the reporting of these symptoms have been long-associated with occupational related causes, many studies have nonetheless continued to report regarding the occupational risk exposures and their resulting cases of contact dermatitis, the existence of which, have well-continued until recent years. Healthcare workers, pharmaceutical industry workers and construction workers collectively suffer from contact dermatitis due to their risks of occupational exposures, either through means of allergic contacts, chemical irritants, or photo allergic exposures. Early diagnosis for occupational related contact dermatitis could contribute towards a better prognosis. A delay in the medical consultation could likely prolong the deterioration of existing symptoms, and henceforth a poorer recovery outcome. It is therefore essential to recognize the needs for early diagnosis and improve medical service access with regards to such occupational risk exposures.

Keywords: *Contact Dermatitis, Occupational health, Occupational medicine, Healthcare workers*

INTRODUCTION

Occupational skin diseases, including allergic contact dermatitis and irritant contact dermatitis, have been commonly reported across various occupations. In a survey of 1434 patients undergoing patch testing to identify the most common allergens, Suneja and Belsito (2008) observed that when comparing the Healthcare workers (HCWs) with non-Healthcare workers, the research data demographics had shown a higher proportion of the survey participants to be more likely coming from the female gender. These patients clinically presented themselves with hand dermatitis and a medical history of atropy, when compared with other groups of non-healthcare workers. HCWs when compared to workers from other occupations, have also appeared to be showing a higher rate of work-related irritant dermatitis from contacts with those chemicals that were commonly used in the pharmaceutical industry and the manufacturing of medical equipments, such as the quaternium-15, thiuram, carbamix, glutaraldehyde and benzalkonium chloride. The healthcare workers were also reported to have a higher number of cases for allergic contact dermatitis exposures to latex materials, such as the disposable latex gloves. The prevalences of the cases of allergic contact dermatitis and Allergic Contact Urticaria also were found to be generally higher among the healthcare workers, than of that seen in the general population.

IRRITANT CONTACT DERMATITIS (ICD)

In recent years, some investigation findings reported pharmaceutical industry workers suffering from irritant contact dermatitis (ICD) as a result of exposures to pharmaceutical chemicals (Goh and Kwok, 1985) on the observed cases of Photosensitivity skin reactions to be

associated with exposures to Carprofen. From a historical perspective, the nonsteroidal anti-inflammatory drug carprofen has been commonly used for patients in the 1980s, before its withdrawal due to the establishments of its adverse effects. It has since then re-emerged for veterinary uses, for which it is still widely prescribed, since the 1990s. Kerr, *et al.*, (2008) have also identified Carprofen as a potent cause of photoallergic contact dermatitis (PCD) among pharmaceutical factory workers presented with facial dermatitis. Their study findings were confirmed through the use of photopatch testing of carprofen dilutions onto patients who were presented with photoexposed site dermatitis.

In another study on the occupational allergic contact dermatitis (ACD) caused by Azithromycin (a subclass of the macrolide antibiotics) among pharmaceutical workers, it was concluded that the daily manipulation with powdered azithromycin and similar intermediates is a main route of sensitization (Milkovic-kraus, Macan and Kanceljak-Macan, 2007). Besides contact sensitization, other possible workplace-related azithromycin hypersensitivity reactions were also presented, although less commonly used. These include urticaria, rhinoconjunctivitis, laryngitis and/or dyspnoea.

ALLERGIC CONTACT DERMATITIS

In a study of occupational contact dermatitis at the New South Wales region of Australia, 570 patients with occupational contact dermatitis (OCD) were detected between 1984 and 1990 at the Skin and Cancer Foundation. 336 (59%) were followed up 1 to 5 years later. Roughly 1/3 was healed, 1/3 improved without complete healing, 1/4 had no change and 1/12 of the patients had deteriorated. The overall improvement rate was in excess of 70%. Data derived from these patients demonstrated that changing the work duties of patients with OCD improved their outcome ($p < 0.01$), whilst leaving the industry altogether resulted in a greater overall healing rate ($p < 0.01$). However, no differences were found to exist between the outcome of irritant contact dermatitis patients, compared with allergic contact dermatitis ones. Diagnosis of atopics as expected had a worse prognosis. The outcome in case of the construction industry was significantly poorer than other industries. Patients suffering from allergic contact dermatitis from chromate also had a dismal prognosis (Rosen and Freeman, 1993)

Heavy metal toxicities such as chromium and cobalt have long been recognized as being important causes of occupational contact dermatitis, particularly of the hands, although their exact contribution to occupational hand dermatitis varies in different studies. For cobalt-related occupational contact dermatitis, like the occupations hairdressers, builders and building contractors, retail checkout operators, machine operators and domestic cleaners (Athavale, *et al.*, 2007) are the most common. The researchers concluded that chromium was reported by dermatologists as the potential cause of occupational contact dermatitis in 6% of all cases in the U.K., and cobalt in 4% of the cases. Their data supported the view that chromium-related dermatitis cases are associated with an onset in later period of the professional life and often affects those in the building trades, whereas cobalt-related dermatitis seems to have an earlier onset and may affect a wide range of employments. Occupational exposures to metal Chromium have been of common occurrence in the workplace amongst profession of the building and construction industry, particularly for those working as builders and building contractors, bricklayers, construction workers and plasterers. Some European studies, reported cases of chromium-related dermatitis, which have been reduced, following the new manufacturing practice of the addition of ferrous sulphate to cement supplies (Athavale, *et al.*, 2007).

In some developing as well as developed countries, the types and patterns of contact allergen reported cases could also be reflecting the economic growth pattern of a nation, particularly when there has been a shift of employment types, such as the progression of the manufacturing secondary industries towards a service orientated tertiary industries. The prevalence of chromate allergy among all patients tested at the Contact and Occupational Dermatoses Clinic at the National Skin Centre in Singapore had fallen progressively from 1983 to 1989 (Wong *et al.*,1998). Chromate has also become a less common occupational allergen because of the decline in the number of cases of allergic contact dermatitis as result of contact with cement. In the study conducted by the Singapore National Skin Centre on Eight hundred and fifty cases of work-related skin allergy over a 6-year-study period, 633 patients (74.5% of the cases) were diagnosed to have occupational contact dermatitis, of which 257 patients (40.6%) were presented with allergic contact dermatitis. Eighty-seven (33.8%)

of these workers had positive reaction to chromate on patch testing. Ninety-five percent of these workers were men with a mean age of 33.4 years. The construction industry contributed to 59% of the workers with chromate allergy. Cement (61%) remained the most common source of chromate allergy in the workers, and chromate from sources other than cement (39%) accounted for the rest. Of workers allergic to chromate from cement, 96% (51 of 53) came from the construction industry. Sixty percent of the workers with chromate allergy had concomitant contact allergens and the coexistence of two or more allergens was significantly more common among non-construction workers (53%) than the construction workers (22%). The three most common concomitant contact allergens were cobalt (28%), rubber chemicals (21%) and nickel (18%). Non-construction workers had significantly higher rates of nickel allergy (36% v 6%) than construction workers ($P < 0.03$). Simultaneous reactivity to cobalt and nickel was also significantly more common among non-construction workers (22%) than construction workers (6%) ($P < 0.03$).

For those developing countries which have grown to become 'developed nations', it is commonly expected to have a lower proportion of blue-collar workers from the primary industries such as the building and construction industries, which could then affect the rates of chromate contact allergen cases from the cement materials. It was also noted that reported cases of concomitant nickel allergy, as well as simultaneous nickel and cobalt allergies, were more common among non-construction workers when compared with construction workers.

CONCLUSION

Early diagnosis for occupational related contact dermatitis could contribute towards a better prognosis. As Holness, *et al.*, (2007) have highlighted, the longer the duration of symptoms before diagnosis, the poorer the outcome. It is therefore critical to recognize the needs for early diagnosis and improve medical service access. It is important to understand the underlying genetic and environmental agents contributing to occupational related contact dermatitis. Though there is enough progress with reducing exposure to some allergens, the occurrence of occupational contact dermatitis continues to be elevated, mainly associated with wet work. New prevention programmes are being developed and estimated which hold assurance of improved results.

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