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An Overview On Health Problems In Tannery Industries

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Abstract

In the leather industry, Cr (III) is used as a basic tanning agent. The wastewater discharged from the tannery industry contains a high concentration of chromium. In South Asian developing countries like India, Pakistan and Bangladesh where the economy is strongly dependent on leather manufacturing industries, there is a need to spread proper information regarding the harmful effects of chromium toxicity to the workforce employed in the tannery and also to the people living in the surrounding area. Employees of leather manufacturing companies had numerous health problems. This study looks into the health problems that employees of a leather manufacturing company face. According to this study, employees of leather manufacturing companies face a variety of health problems; the most prevalent ones in the tanning industry are cancer, musculoskeletal disorders, respiratory disorders, and skin disorders. In order to determine possible occupational health hazards that could be a contributing factor to the observed health problems, this review paper evaluates the work environment and job duties. Providing personal protective equipment, improving health and safety training programs, implementing ergonomic improvements, and cultivating a culture of health and well-being within the company are all aided by this study.

Index Terms: Tannery Industry, Health problem, Musculoskeletal injuries, Respiratory effect.

Introduction

The health and well-being of workers in various industries are of great importance, and the leather manufacturing sector is no exception. The leather industry is known for its labor-intensive processes, involving tasks such as tanning, dyeing, cutting, and stitching. These processes often expose workers to a range of occupational hazards and potential health risks. [1] Factors such as prolonged exposure to chemicals, poor ergonomics, physical exertion, and inadequate safety measures can contribute to adverse health outcomes among the workforce.[2] When work is associated with health hazards, it may cause occupational disease, is one of the multiple causes of other disease or may aggravate existing ill-health of non-occupational origin. In developing countries, where work is becoming increasingly mechanized, a number of work processes have been developed that treat workers as tools in production, putting their health and lives at risk. [3]

Richard Helmer, director for occupational health at WHO, at an international conference on occupational health in Helsinki, Finland, said that developing countries account for three-fourth of the global workforce. This has been on a continuous rise because of shifting of industries from the industrialised world to the developing countries, but lack of infrastructure to provide good working conditions and poor implementation of labour laws may further deteriorate the health of workers [4]

Health problems in Tannery Industries

Tannery workers have been known, from previous studies, to have the potential for exposure to numerous known or suspected occupational carcinogens including hexavalent chromium salts and arsenic-containing organic solvents (benzene, formaldehyde, butyl acetate, ethanol, aceta acetate, toluene and acetone). The two major sources of chromium particulates in the tannery work environment are chromium sulphate in inorganic form and in the protein-bound form that is known as leather dust. The leather dust produced by mechanical operations including buffing and shaving contains three per cent of mostly protein-bound chromium.[5]

Workers in the tannery are exposed to these chemicals and dust (including leather and hide dust) in various ways: (a) inhalation in the form of gases, dust, vapours, mist and fumes; (b) ingestion, when workers are eating, drinking, or smoking in the work area without washing contaminated hands; and (c) dermal absorption generally through the pores or cuts/wounds or adsorption. Though each chemical is not necessarily hazardous to human health, it can be an inherent source of the hazard. It can be the chemical itself, any emissions generated during the handling of the chemical, or the container used for storage and transport of chemicals. The impact of such exposure can cause temporary dizziness, headache, irritation of eyes, skin or lungs, poisoning of liver, kidney, or nervous system, or collapse due to lack of oxygen. Long-term illnesses can readily occur including occupational asthma, dermal/nasal ulcers, bronchitis, or genetic defects. In some cases, even instantaneous death can occur [6]

Respiratory Effects

The most common morbidity as a result of dust exposure is reported to be chronic bronchitis due to multiple and continuous exposures to leather dust, hide dust, chemical vapours, fumes and toxic gases. Irritation of upper respiratory tract is common on acute exposure to these hazards, and sometimes may result into occupational asthma. Acute respiratory toxicity can occur on exposure to high concentration of gases in the work environment. In a study on tannery workers, the number of those with respiratory obstruction detected by spirometry was 294 cases (40.27 per cent), more than the number of cases, at 263 (36.02 per cent), who claimed having respiratory problems. [7]

Skin Disorders

Skin disorders such as eczema and allergic contact dermatitis have been diagnosed among leather tanners exposed to preservatives applied to the hides. (Abrams and Warr, 1951) The leather tanning and finishing process has been shown to have the highest incidence of dermatoses of any working group in the United States. (Stevens, 1979) Irritations of the mucous membranes of the throat and nose, and perforations of the nasal septum may also occur after inhaling chromic acid fumes liberated during the chrome-tanning process.

Chrome ulcers of skin are painless, multiple ulcers or holes on the skin of the exposed parts of the body, especially hands and feet. In a study conducted on tanneries of northern India, the prevalence of ulcers of fingers and toes among chrome tanners was found to be 10.6 per cent. Chrome ulcer of the skin is a notifiable disease under the Indian Factories Act, 1948. It is a compensable disease as well.

Anthrax is caused by a biological agent Bacillus anthracis. Infection to the workmen occur when the infected hides or skins are handled and anthrax spores find their way through skin abrasions, resulting in skin ulcerations commonly known as cutaneous anthrax or malignant pustule. Inhalation of spores does

occur rarely and the worker may develop haemorrhagic pneumonia of lungs known as pulmonary anthrax. It is a fatal disease. Anthrax is a notifiable disease under the India Factories Act, 1948. It is also a compensable disease prescribed under Workmen's Compensation and ESI acts. Some years back, cutaneous anthrax had been very prominent among tannery workers in Australia, but is not reported now.[8]

Callosities (thickening of skin at pressure points), especially of shoulder and palm, is caused due to repeated pressure and motion effects while the hides and skins are handled and transported manually by the workers.

Musculoskeletal Injuries

Acute musculoskeletal injuries are caused by physical overexertion and awkward posture while moving heavy or bulky loads, in particular bundles of hides, skins and leather. Lower-back pain due to prolonged working in a standing or semi-bending posture is common.

Prolonged standing may also lead to pain in feet and lower back, bunions/corns, locking of joints, varicose veins and problems related to reproductive system, heart and blood circulation. Muscle fatigue can also occur, as both standing and walking require constant muscle work [9]. Long sitting postures may also cause some gastrointestinal problems or problems related to excretory system.

Heat stress, in particular when working on warm days in premises lacking good ventilation or air conditioning, has also been reported.

Cancers

Tannery workers are likely to be exposed to numerous known or suspected occupational carcinogens including hexavalent chromium salts, benzidine-based azo dyes, organic solvents (e.g., benzene and formaldehyde), pentachlorophenol, N-nitroso compounds, arsenic, dimethylformamide and airborne leather dusts. These exposures may result in the development of various site-specific cancers. An excess of lung cancer has been observed in studies carried out in Italy [10/11] and in a case-control study carried out in the United State [12], but this result is not always supported by other studies [13/14/15]. Chromium and arsenicals were mentioned as possible contributors to the lung-cancer excess. A significantly increased risk of soft-tissue sarcoma has been observed in at least two separate tannery studies, one in Italy and one in the United Kingdom; the investigators of both studies suggest that the chlorophenols used at the tanneries may have produced these malignancies. [16]

A threefold statistically significant excess in pancreatic cancer mortality was noted in a Swedish case-control study [17] Despite the excess risk of pancreatic cancer, no specific environmental agent was identified, and dietary factors were considered a possibility. An excess risk of testicular cancer was observed among leather tanners from the finishing department of one tannery; all three workers with testicular cancer had worked during the same time period and were exposed to dimethylformamide [18/19]. An excess risk of sinonasal cancer among leather tannery workers was observed in a case-control study in Italy; chromium, leather dust and tannins were indicated as possible etiological agents[20/21]. However, IARC research in the early 1980s found no evidence of an association between leather tanning and nasal cancer. (IARC, 1981) The results of a study of the Chinese leather tanning industry showed a statistically significant excess morbidity from bladder cancer among those tanners ever exposed to benzidine-based dyes, the incidence of cancer increasing with duration of exposure [22].

Conclusion

This study reveals that workers in the leather manufacturing company experience a range of health issue, with respiratory effects, skin disorder, musculoskeletal injuries, cancers are being the most common problem reported. This study evaluating the effectiveness of specific interventions aimed at reducing occupational hazards and improving worker health. This may include interventions such as implementing

engineering controls, providing personal protective equipment, introducing ergonomic improvements, or offering health promotion programs.

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