Risks To The Health Of Wood Workers: What Can Be Done?

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ABSTRACT

OBJECTIVE: To identify health problems of wood workers and suggest recommendations for its prevention.

METHODS: Extensive online search was made for medical literature on it published in English from 1960's to date.151 articles were retrieved which were tailored to 124 including books, reviews and epidemiological studies.53 of them were relevant and are included in this review.

RESULTS: Wood workers are exposed to wood dust, fungi, bacteria, endotoxins, formaldehyde, phenol and various injuries in their working environment. This leads to impaired pulmonary functions; non-cancerous respiratory diseases like rhinitis, chronic bronchitis, hypersensitivity pneumonitis; occupational cancers like sino-nasal cancer, laryngeal carcinoma, lung cancer, mesothelioma, Hodgkin's disease, bladder cancer, skin cancer, prostate and brain cancer. This can be prevented by decreasing exposure to wood fumes in air by proper ventilation and decreasing work hours by increasing shifts, personal protective equipment and regular nasal lavage.

CONCLUSION: Wood workers are exposed to various biohazards at their work place which increases risk of occupational diseases which can be prevented by provision of healthy work environment.

KEY WORDS: wood workers health, wood industry exposures, diseases in wood workers

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INTRODUCTION:

Woodworking is a process of "building, making or carving something out of wood" [1] and a woodworker is one who "makes things out of wood" [2]. Wood working is one of the major manufacturing industries of Pakistan with about 700 registered wood working units including the cottage and small scale industries throughout the country [3]. Exposure to mainly wood dust, allergenic fungi and endotoxins leads to various health problems in the wood workers [4].This article aims to identify the health problems of wood workers and to suggest interventions and recommendations based on evidence to improve health and prevent woodworking related diseases in these workers.

METHODS:

In the light of the above mentioned study objectives online search of the terms **"woodworkers" AND "health" OR "disease" OR "illness"** and the terms **"wood factory" AND "health" OR "disease"** was made and a total of 2849 articles were found on googlescholar(2720), Pubmed NLM(61), EBSCOHOST(4), Cochrane(1), Springerlink(63) and Pakmedinet(0). Searching "woodworkers" in the 'title or abstract' and searching only in 'medicine section', 151 articles were retrieved which was tailored to 124 articles after excluding those duplicated on various search engines: 6 books, 12 reviews and 106 epidemiological studies comprising cohort, case-control and cross-sectional studies and also a few case series and case reports.53 abstracts were found to be relevant to the topic: "health of wood workers" and are included in this review.

RESULTS:

Exposures in Wood Industry:

Wood workers are exposed to a large variety of exposures in the wood industry: wood dust (average exposure of 0.33-5.2 mg.m-3)[6-10]and other biohazards related to wood dust like fungi, bacteria and endotoxins[11,12], chemicals like formaldehyde[13] and phenol [14,15] and physical injuries due to nature of their job which is a burden on the health cost[16]. Sanding, manual work, use of compressed air, use of full-automatic machines, cleaning of work pieces with compressed air, kitchen producing factories and small factories (<20 employees) increases the wood dust concentration[17]. While sanding with adequate exhaust ventilation, manual assembling/packing, adequate exhaust ventilation, vacuum cleaning of machines and special cleaning staff decreases the wood dust concentration in the wood industry [17].

Adverse Health Effects:

1. **Symptoms:**

Due to above mentioned exposures, wood workers experience a variety of symptoms ranging from blocked nose while at work, coughing, redness of eyes, itchy nose, phlegm, symptom of asthma and chronic bronchitis and ear problems [6,9-11, 18]. Direct cause for it is unproven [19]. Dose response relationship between wood dust exposure and symptoms of asthma [9] and chronic bronchitis symptoms [20] has been reported, though this is an inconsistent finding [20, 21].

2. Impaired Pulmonary Functions:

Mean forced expiratory volume in one second (FEV1) and forced vital capacity (FVC) has been demonstrated to be lower in smoker and non-smoker woodworkers of both genders [4-7, 22-23].Both these lung functions have been shown to have dose-response relationship to wood dust exposure [4, 5, 7, 23] and peak expiratory flow also significantly decreases with increasing years of exposure to woodwork [12]. Alwis KU et al reported the dose response relationship to be pronounced among joinery workers as compared to sawmill and chip mill workers [11].

3. Non Cancerous Respiratory Diseases:

Woodworkers are at risk of developing various respiratory diseases with involvement of upper airways by rhinitis [24-26]with prevalence of 78% [24], chronic bronchitis [20] and asthma [8, 26-28] prevalence of 6.5% [28], hypersensitivity pneumonitis due to wood moulds [26]and pneumoconiosis due to a type of wood dust called paulownia [29].Some studies have shown that as period of woodwork increase the prevalence of rhinitis and asthma also increase [24, 28].

4. Occupational Cancers:

Increased incidence of nasal cancers among woodworkers date back to 1956-1965, when its annual incidence was 500-1000 times more in people working in wood industry compared to the general population in England [30]. International agency for research on cancer (IARC) classified wood dust as carcinogen in 1994 based on its strong evidence to cause sino-nasal cancers [31], relative risk ranging from 3 - 11 in woodworkers [32].They are at increased risk of developing adenocarcinoma of nasal cavity [24, 33-36] (nose and paranasal sinuses) and it increases with longer occupational history of exposure to softwood dust in combination with hardwood dust [34, 37]. Strongest association of both is observed in occupations where workers are exposed to hard wood dust without use of chemical additives [38]. Average induction period for development of nasal adenocarcinoma after wood dust exposure is reported to be 40 years (range 7-70 years) [36, 37, 39].

Wood dust or chemical compounds like phenol [15, 40], formaldehyde [13] and terpenes [15] in wood industry can lead to a variety of

respiratory tract cancers including laryngeal carcinoma [41], lung cancer [15, 42-45] and mesothelioma [45].

Other neoplastic and malignant diseases reported in woodworkers are neoplasias of respiratory, digestive and urinary tract as well as of hemopoietic and lymphatic system including Hodgkin's disease [36]; malignant lymphoma including non-Hodgkin lymphoma [46]; stomach cancer [43, 47]; bladder cancer, skin cancers and leukemia [43]; prostate cancer [31] and fatal brain cancer [31].One study in 1984 reported significantly decreased rates of colon-rectum cancer and coronary heart disease in woodworkers [43].

5. Other Health Effects:

In addition to above mentioned health problems, woodworkers also experience occupational accidents [16, 48] and contact dermatitis [49].

DISCUSSION:

Much literature is available on "Health of wood workers" internationally with major studies being conducted in the developed countries. Only one study was found determining the pulmonary impairment in the wood workers in local context in Pakistan [4, 5]. Epidemiological and environmental research is needed in this field for risk assessment and generation of evidence. This will further help in risk management and making policies to safeguard the health of the wood workers.

In order to provide safe occupational environment to the woodworkers and prevent risks caused to their health by the hazards in wood industry, following are the recommendations based on evidence:

- Reduction of dust and fumes in the air [31]: Improvement of exhaust ventilation, professional cleaning methods and avoiding use of compressed air in wood factories [17].
- Wood-dust exposures should not exceed an 8-hour time-weighted average 5 mg/m3 standard [35] which maybe done by more shifts and decreasing the working hours of the workers.
- Use of personal protective equipment [14] will not only decrease injury among workers but also prevent from wood dust exposure.
- Reduction of exposure to chemicals: Implement an alternative means of anti-sapstain treatment in wood industry and to seek an end to the use of chlorophenol for this purpose [14].
- Mucocilliary function is impaired in woodworkers who are exposed to wood work for more than 10 yrs [50] which may lead to a variety of diseases. This can be prevented by regular nasal lavage which is effective and inexpensive way to reduce the nasal symptoms and was found to be acceptable to wood

workers in one of the studies [51].

CONCLUSION:

Wood workers are exposed to many hazards at their workplace which increases their risk of adverse health effects ranging from non cancerous to cancerous conditions. They can be provided with healthy occupational environment by making and implementing polices and interventions in the light of evidence in local context. Therefore environmental and epidemiologic research in this field in our country is suggested.

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ABSTRACT: Wood dust may induce health risks on exposed timber or wood workers, one of which is ENT disorders. This article aimed to detect ENT pathologies found among woodworkers in Parakou. It was a cross-sectional descriptive study carried out from 1st March to 31st May, 2012 in Parakou, North-Benin. It involved 703 carpenters and sawyers operating in timber workshops in Parakou, regardless of age and sex. The mean age of the wood-workers was 26.14 Â± 7.77 years. Their seniority in the timber profession was on average 4.9 Â± 2.64 years. All of them were males. It had been noticed that 81.6% of Wood dust is an irritant and is carcinogenic to the nasal mucosa. It inhibits its own clearance from the nose. It therefore makes sense to lavage retained wood dust from the nose following exposure. To our knowledge this is the second study conducted to determine whether the procedure of nasal lavage reduces nasal symptoms in woodworkers. Forty-six woodworkers from 150 approached volunteered to trial nasal lavage using gravity fed, home-made unbuffered isotonic saline for 2 months in a crossover trial and then be followed-up a year later. The group reported significantly decreased nasal sympto...Â Risks To The Health Of Wood Workers: What Can Be Done? S. Idris Mirza. 2010.