

Review Article

Review of diseases in which occupational cause is likely in medical practice.

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ABSTRACT

Whatever a medical doctor's specialty, he or she may come across diseases related to occupation. The commonest of such diseases seen by the general practitioner are stress reactions. The orthopaedic surgeon is seen by patients with complaint of symptoms of over use syndromes, in the limbs and also back and waist problems. People who work with vibrating tools may come down with Raynaud's syndrome and need to consult general surgeons. Workers in noisy work places may suffer noise induced hearing loss, or deafness or other symptoms like tinnitus. All these people need the expert care of E.N.T (Ear, Nose and throat) surgeons. Females whose work exposes them to chemicals may suffer gynaecologic and endocrine reproductive problems many of such women suffer from infertility and need treatment by gynaecologists before they can have children. Dusty work places make workers come down with occupational lung diseases, and need treatment in respiratory medicine clinics. Some chemicals, encountered in some work environment cause renal and bladder problems. These conditions may need to be treated by internal physicians or even surgeons with bias for urology. There are also many non-specific symptoms that maybe related to the work place. The diagnosis of the above conditions depends on the medical doctor being alert to the possibility of an occupational cause and being able to take an appropriate occupational history.

Key words: Review; Occupational; Diseases; Medical Practice

INTRODUCTION

Occupational medicine is a specialty that crosses traditional medical boundaries into other scientific fields and the world of industry. New medical graduates are often completely ignorant of occupational medicine, yet most soon realize that some knowledge of the subject is desirable if the patient's needs are to be adequately served.

Diseases in which occupational cause is likely in medical practice:

Skin Diseases: Main symptoms of skin diseases are itch, appearance of a rash or lump and occasionally pigmentary changes. The main symptoms of occupational skin diseases are the same as for other skin diseases. However, all cases of occupational skin diseases occur initially

at the site of contact, with the offending agent. In order to diagnose an occupational disease, a careful history of the evolution of the lesion is necessary. The chemicals and other materials a patient came in contact with need to be reviewed. The doctor should find out if others in the patients work place have similar problems. This is because occupational skin disease often occurs in clusters.

Contact Dermatitis: Most common occupational skin disease seen in clinical practice is contact dermatitis. It can be irritant in nature or allergic irritant dermatitis can be caused by cement as seen in construction workers etc. Other causes include oils as seen in operators of machinery; solvents, used in painting and cleaning,

detergents, used in house work, hair dressing, cleaning; and fibre glass used in insulation and in building. Allergic dermatitis can be caused by the following:-. rubber gloves used by surgeons, technicians, nurses etc; epoxy resin hardners used in electrical manufacture, joinery, and repair work. cobalt used in making glass and pottery, dyes and perms used in hairdressing; woods especially hardwoods used by joiners and carpenters, also cause contact dermatitis. Other occupational skin diseases include skin infections².

Lung Diseases: Presentation of both occupational and non-occupational lung disease are the same. The patient presents with the following symptoms: breathlessness persistent cough, chest pain. There is a report of an abnormal chest radiograph. Occasionally there is anxiety of being harmed by something at work. Most of the well-known syndromes of lung disease have one or more occupational causes. The key to their detection is occupational history.

Occupational Asthma: Diagnosis is easily missed unless the following key questions are asked. Does the wheeze change at weekends or on holiday? Does anything at work affect your chest?³

Occupational causes of lung disease: Occupational causes of lung diseases are numerous and include the following: Asthma, which can be caused by contact with animals, hardwoods and grains^{3,4,7} cigarette smoke and coal dust cause allergic alveolitis⁸, while radiation, and asbestos cause bronchial carcinoma^{8,16} Beryllium causes sarcoidosis^{8,22} whereas silica, coal and asbestos cause diffuse or nodular fibrosis of the lungs. Healthcare workers who come in contact with Mycobacterium tuberculosis in the course of their duty could develop tuberculosis^{3,7}.

Toxic fumes like those of cadmium cause pneumonitis^{8,16,18,20} Pneumonia caused by

legionella species is seen in workers working on faulty air – conditioning systems⁴. Asbestos causes many occupational lung diseases as mentioned above and also pleural fibrosis and mesothelioma; same goes for silica which in addition also causes pleural fibrosis⁴.

Bronchial Carcinoma: If a patient presents with a rare cancer or a common cancer in unusual circumstances (e.g oat cell carcinoma in a young non-smoker) always suspect an environmental or occupational cause. Also make inquires if someone with cancer has worked in the chemical industry. Patients with silicosis also have an elevated risk. No features distinguish occupational lung cancer from the disease associated with cigarette smoking. Asbestos, radiation and other causes add to the risk from smoking. Smokers develop cancer relatively late in life, but those exposed to chemical carcinogens often develop the disease rather early—Just about ten years after the start of exposure in case of chloromethylethers.⁵

Acute Attack of Breathlessness: An acute attack of breathlessness is most commonly due to asthma or left ventricular failure. In occupational diseases, acute allergic alveolitis and inhalation of toxic gas, cause acute attack of breathlessness.

Chronic Breathlessness: Chronic, steady worsening breathlessness is usually caused by irreversible or partly reversible airflow obstruction, cigarette smoking being the main cause. Less commonly, restrictive lung disease usually due to pulmonary fibrosis is responsible. Occupational factors may be involved in either of these syndromes. Non-asthmatic chronic airflow obstruction is usually caused pathologically by emphysema. High level of dust in work places especially coal mines may contribute to the development of emphysema and airflow obstruction. Asbestosis is a progressive disease

with lower zone fibrosis spreading to the lungs silicosis is also progressive.⁵

No Symptoms, But Abnormal Chest Film:

Some occupational lung diseases cause abnormalities of the chest radiograph but no associated symptoms or functional abnormality. Pleural plaques, which often calcify may be quite extensive as a result of asbestos exposure. These are harmless. Coal workers pneumoconiosis also may cause a heavy profusion of spots on the film without any functional impairment. Other pneumoconiosis due to inhalation of tin refining fumes, iron oxide in welding and metal polishing and barium sulphate in its production cause dramatic X-ray abnormalities and no harm.⁶

Chest Pain: The asbestos related diseases may present with chest pain, usually associated with breathlessness.

Mesothelioma is a malignant disease of the pleura (rarely of the peritoneum) caused mainly by exposure to crocokolite asbestos in ship wards and insulation work, decades previously.^{7,8} Pneumonia can be acquired from the work environment. A doctor seeing a patient with pneumonia should inquire about the work place and especially about the possibility of aerosols of recirculated or contaminated water. The best known cause is legionella disease spread by circulation of droplets from contaminated air conditioners and cooling systems.⁹

The hand, arm and back disorders: Vibrating white finger is due primarily to vascular spasm induced by using tools vibrating mainly in the range 20-400Hz. It may become a permanent disability even after use of the tools. Thus any manual worker presenting with features of Raynauld's disease should be questioned about the use of tools.¹⁰

Upper Limb Strain Disorders: On movement of the upper arm, pain in the shoulder may be due to frozen shoulder or, rotator cuff syndrome. Pain in the elbow tennis elbow, may be due to or golfer's elbow. Forearm pain may be due to (tenosynovitis) or if in the hand due to trigger finger, de Quervain's syndrome in all these cases patient's occupation maybe an aetiological factor, so details of the work performed must be sought¹¹. Often repetitive movements, in awkward positions of the joints are the usual cause. People most at risk are keyboard and visual display unit operators, hairdressers, cleaners, musicians and music teachers.¹¹

The Painful Back: Most problematic from occupational point of view is low back pain. There are two syndromes—acute disc prolapses provoked by sudden strain on the lumbar spine and which is associated with sciatic pain, limitation of spinal flexion, and straight leg raising and often neurological signs. The condition occurs frequently as a result of awkward lifting or sudden back strains in the work place. The incidence of the condition may be reduced by proper design of the workplace and of the tasks. Provision of appropriate aids and training in lifting techniques.¹⁰

Chronically Painful Back: The second syndrome is the chronically painful back with limitation of movement, occurring in older male workers, and associated with degenerative changes in the spinal joints. This condition is due to repetitive trauma of the back. These two syndromes can be alleviated by surgery.¹⁰

Disorders of The Hip: Osteoarthritis of the hip is a very common condition of the elderly and may be contributed to by occupational factors. Farmers are at increased risk.¹²

EAR, EYE and NOSE disorders

Hearing loss and tinnitus. The damage is measured by audiometry. Workers at special risk of hearing damage are usually those in heavy productive industry, such as metal work, drilling and quarrying, stone cutting or use of noisy machinery, as in textiles, printing, wood cutting, transportation and agriculture. Noise above 90 decibels (as measured with special instruments that are electronically weighted to mimic loudness functions of the human ear) cause hearing loss and tinnitus. The harmful effect of noise are cumulative. Frequenting discos has resulted in young people having some degree of hearing loss before even they start work. In addition to protecting workers from noise, many companies now carry out pre-employment audiometry.^{13,14}

Disorders of The Eye (Sore Eyes): Complaints about sore or aching eyes are among the most common symptoms encountered in occupational medicine in organization, which use visual display units. These are rarely serious. If there is also evidence of a defect in refraction; then it indicates poor design of the work place, in terms of lighting, screen reflectance or even posture at the desk. On the other hand eye injury due to foreign body or burns is potentially very serious and common.¹⁵ Though easily preventable. Eye injury may also occur as a result of exposure to light, Keratitis is conjunctivitis caused by inadequate eye protection in arc welding, while accidental exposure to laser beams (some times reflected inadvertently off a polished surface) may cause serious corneal or retinal burns. Protection from lasers depends critically on the wavelength of the light which the laser beams, and goggles must be specific to the laser being used. Itchy eyes are frequent complaint in workers exposed to organic antigen, such as grain dusts. The symptom is often a herald of occupational asthma. Chlorine or formaldehyde

on the other hand cause non-allergic eye irritation.³

Rhinitis—Allergic rhinitis is a common herald of occupational asthma, usually in association with exposure to organic antigen from vegetable matter or from animals. Sometimes rhinitis is the sole manifestation of such allergy. In severe cases nasal polyposis occur.

Septal Ulceration—Uncontrolled exposure to metal fume or dust, chromates (sometimes in cement) cause ulceration of the nasal septum an often painless condition.

Carcinoma—Exposure to dust in furniture and leather goods manufacture cause carcinoma (adenocarcinoma being the usual histological type).

The nervous system: Solvents, are lipid soluble so can be retained in nervous tissue which contain a lot of lipids. Painting, cleaning, carpet-tile laying, laboratory and chemical work, degrading operations and those whose jobs expose them to petroleum products stand the risk of toxic chemical entering their brain tissue. Only substance abuse, alcoholism, glue-sniffing and other solvent exposure can contribute to or cause neuropsychiatric disease. This ranges from a syndrome headache, loss of concentration and short term memory and depression, full-blown dementia or neurological disease. Whenever a doctor sees patients with diseases such as motor neuron disease, the possibility of occupational causation should be borne in mind.^{17,18} Peripheral neuropathy is a motor neuropathy, characterized with wrist drop and is a classical feature of lead poisoning. Parkinsonism is caused by chronic manganese poisoning, prolonged exposure to carbon disulphide and acute carbon monoxide, poisoning. Poisoning may lead to the development of a parkinsonian syndrome, as well as other central nervous system damage.⁵

Stress Reactions: Majority of patients seen in occupational medical practice with neuro-psychiatric symptoms are suffering from psychological rather than chemical stress. Such patient, present with anxiety and depression, and an array of minor physical symptoms, a history of adverse reaction to stress at previous times is often present and causes are usually multiple involving home, and family as well as work. Poorly paid job with little prospect of satisfaction or promotion.¹⁹

Psychological Breakdown: Psychological breakdown can occur in a worker with recent promotion beyond capacity, conflicts due to multiple responsibilities, too many demands on time,^{17, 19} A tiring shift pattern, excess overtime, too little or new technology, can also cause psychological breakdown¹⁹. If a new or unreasonable boss increases productivity targets, or there is threat of redundancy, sexual harassment or bullying, high sickness absence in colleagues. The workers in such work places can also suffer psychological breakdown.

Disease of the liver and gastro intestinal tract

A wide range of liver diseases have occupational causes but are rare. The gastrointestinal tract is almost untouched by occupational disease although oesophageal and stomach cancers are seen more in rubber vulcanizers and coal miners respectively. The liver transforms lipid-soluble chemical into water soluble ones, with the usual result of a less toxic metabolite. Occasionally the reverse occurs e.g acute hepatic necrosis caused by carbon tetrachloride as occurs in dry-cleaning workers.

However, it is seen that even in workers in a chemical industry, abnormalities in liver function are more likely to be related to alcohol or other causes than to occupational factors.²⁰

Urinary tract diseases: Occupational causes of acute renal failure, are high level exposure to cadmium dust or fumes released by cutting metal alloys, making pigments and battery manufacture. Chronic renal failure following damage to nephrons is caused by carbon disulphide and a wide range of solvents. Bladder cancer is seen in those working in rubber tyre industry and in the manufacture of organic dyes.²¹

Disorders of the reproductive system: Factors at work can cause infertility, miscarriage, and foetal abnormalities. Heavy physical work during pregnancy may have a harmful effect on the outcome. Toxic substances affect the process of gametogenesis, fertilization and pregnancy. Exposure to ionizing radiation and handling of cytotoxic drugs adversely affect the reproductive organs of males and females. In females, organic mercury is potent reproductive poison that causes infertility, miscarriage and foetal abnormalities,^{19,23}

Occupational blood disorders: Benzene causes marrow aplasia, with normocytic anaemia as clinical feature. Gamma radiation also causes marrow aplasia but with neutropaemia as clinical feature. Lead causes anaemia with impaired haemosynthesis and stripped red cells as clinical features. Aniline and some of its analogue nitrites cause methemoglobinaemia, with cyanosis as clinical feature, cyahosis. This is reversed by ethylene blue. Arsine causes haemolysis whose clinical feature is intravascular haemoglobin. Gamma radiation and benzene cause leukaemia usually the chronic myeloid type. Toluene causes thrombocytopenia, with bleeding disorders as clinical features.^{5,22}

Cardiac Disease: There is strong evidence of association between risk of heart disease and specific occupations. In these circumstances workers exposed to carbon disulphide in manufacture of viscous rayon have an increased

likelihood of death from coronary artery disease. People exposed to nitrates such as glyceryl trinitrate and ethylene glycol dinitrate in manufacture of explosives and of pharmaceuticals have an increased risk of angina and infarction. Those exposed to high levels of halogenated organic solvents such as trichloroethylene may suffer sudden death, probably related to ventricular fibrillation.^{18, 1, 2, 16}

General ill-health and infection: The most difficult patients to investigate and manage in medical practice are often those with non-specific symptoms of malaise and general ill-health. As with all other symptom complexes, the occupational history may lead to diagnosis and appropriate management.

The most important occupational factors are psychological problems and physical problems associated with the building in which the person works, the two not infrequently interacting. Less commonly chronic poisoning or occupational infection may sometimes be severe as when legionella species contaminate an air conditioner and cause outbreaks of pneumonia or when a farmer is infected with leptospira species and dies of hepatorenal failure. Recurrent over dosage with pesticides and solvents may be seen often leading to nonspecific symptoms. Farmers and fruit growers may easily spray selves with carbamate or organophosphorus insecticides and manifest symptoms of anticholinesterase poisoning, headache, blurred vision, weakness sweating and tremor. Recurrent exposure to solvents is particularly liable to occur in the self employed or in people employed in small companies involving painting and floor covering with flexible vinyl materials. Headaches and a feeling of drunkenness are the usual features with the threat of long-term neurological damage.^{7, 22}

CONCLUSION

It is obvious from the text of the paper that occupational diseases are the same disease that affect various parts of the body and the systems. The only difference is that they have occupational or environmental causes. Their management is the same but removal of the patient from the occupational environment that caused the disease, in most cases leads to dramatic recovery of the patient. It is therefore recommended that medical doctors in their practice, no matter the specialty or area of interest should always consider possible occupational causes while managing any disease/disorder in any patient. In this respect the taking of a detailed work (occupational) history will be most appropriate for an accurate diagnosis. If this is done the otherwise missed cases of occupationally related diseases will be recognized and appropriately managed.^{9,23,24,}

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