Diseases related to occupational hazards

Objectives:

- Enlist, major diseases related to occupational hazards Physical hazards, heat, light, pressure, noise, radiation, electricity, mechanical factors Chemical agents Gases, fumes, dust, metals and their compounds, solvents Biological agents Occupational cancers Occupational dermatosis .
- Understand sign and symptoms, and diagnosis of occupational diseases of public health importance

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Important | Extra | Notes

Editing file

Definition:

Occupational diseases are adverse health conditions in the human being, the occurrence or severity of which is related to exposure to factors on the job or in the work environment.

Such Factors can be:					
Physical	Chemical	Biological	Ergonomic	Psychosocial stressors	Mechanical
heat, noise, radiation	solvents, pesticides, heavy metals, dust	tuberculosis, hepatitis B virus, HIV	improperly designed tools or work areas, repetitive motions	lack of control over work, inadequate personal support	mainly cause work accidents and injuries rather than occupational diseases.

Noise
Ex. construction work; prolonged exposure to noise and vibration can lead to headache, nausea and deafness

Ergonomics is the process of designing or arranging workplaces, products and systems so that they fit the people who use them.

Computers are a good example of Ergonomic; when I sit in front of the computer podium I don't have to stand on my toes to reach it or to bend down to see the screen .

Characteristics of occupational diseases:

- The clinical and pathological presentation are identical to that of non-occupational diseases; e.g. asthma.
- Occupational disease may occur after the termination of exposure. Eg: asbestos-related mesothelioma (a cancer affecting the lung and abdomen) which can occur 30 or 40 years after the exposure.

The more frequently you expose the person to gas, chemical or dust the more they will develop the disease

The importance of occupational diseases is that they can mimic natural diseases for example asthma if someone is exposed to dust in the factory and got asthma or the natural asthma from the community how would you differentiate between them ? They both have the same signs, symptoms and presentation you can only differentiate by the occupational history.

The clinical manifestations of occupational disease are related to the dose and timing of exposure; e.g. at very high airborne concentrations, elemental mercury is acutely toxic to the lungs and can cause pulmonary failure, while at lower levels of exposure, elemental mercury has no pathologic effect on the lungs but can have chronic adverse effects on the central and peripheral nervous systems.

Occupational factors can act in combination with non-occupational factors to produce disease; e.g. exposure to asbestos (five-fold increase in lung cancer); and the long-term smoking of cigarettes (increases the risk by 50 and 70 fold.

Diseases due to Physical agents:

Heat	Heat hyperpyrexia, exhaustion, syncope, cramps, burns
Cold	Trench foot, frostbite
Light	Occupational cataracts, miner's nystagmus
Pressure	Caisson disease, air embolism, blast (explosion)
Noise	Occupational deafness
Radiation	Cancers, leukemias, aplastic anemia, pancytopenia
Mechanical factors	Injuries, accidents
Electricity	Burns

Diseases due to Chemical agents:

Gases	CO2, CO, HCN, N2,NH3,HCL
Dusts (pneumoconiosis)	Coal dust (anthracosis), silica (silicosis), asbestos (asbestosis, Ca lung*), iron (siderosis) Cane fiber (bagassosis), cotton dust (byssinosis), tobacco (tobacossosis), hay or grain dust (farmers lung)
Metals and their compounds	Toxicity from Lead, mercury, cadmium, arsenic
Chemicals	Acids, alkalis, pesticides
Biological agents	Brucellosis, leptospirosis, anthrax, tetanus, encephalitis, fungal infections
Occupational	**CANCER:** Skin, lung, bladder **DERMATOSIS:** Dermatitis and eczema
Psychological origin	Industrial neurosis, hypertension, peptic ulcer

Workers at Cane fiber factory (sugar Cane) will develop bagassosis disease.

Cancer of the lung *

The country nowadays is going towards organic foods so this use will increase the amount of pesticides ➔ diseases will increase

Pulmonary dust diseases

Pneumoconiosis is disabling pulmonary fibrosis that results from the inhalation of various types of inorganic dust, such as silica, asbestos, coal, talc and china clay.

e.g. silicosis and asbestosis

Silicosis

IMPORTANT

In KSA we have a lot of gold mines so workers could be exposed to silica and develop silicosis.

Crystalline silica (SiO2)

Occupations:

The major place for developing silicosis.

- mining (coal, mica, gold, silver, lead, zn)
- stone cutting and shaping, sandblasting (building and construction)
- glass and ceramics manufacture
- Iron and steel industry

So the workers will develop silicosis after 7 to 10 years and what accelerates the development of silicosis ? Prolonged exposure to silica dust.

Time to develop:

7–10 years, sometimes less. Prolonged exposure to higher concentrations of dust

Presentation:

co-occurring disease *

dyspnoea on exertion , pulmonary tuberculosis* and cardiac or respiratory failure , impaired TLC (total lung capacity)

Diagnosis: x-ray ....snow storm appearance

The worst thing about silicosis is that even if you remove the patient from the exposure the disease will still progress.

Progressive disease and converts to TB

Management : “prevention and regular physical examinations ”

The X-ray looks hazy, whitish, It's called snow storm, It could be TB or carcinoma
You will not be able to pinpoint the particle; Its the one distinction between silicosis lung and Miliary tuberculosis of the lung. In Miliary tuberculosis secondary to anything the X-ray will have like the head of the needle minor microscopic calcification.

Asbestosis

IMPORTANT

Inhalation of asbestos fibres

These shutters are made of asbestos and with increase in the temperatures they will release fumes.

Occupations:

- mining and extraction
- exposure to asbestos … insulation
- making of asbestos cloth
- manufacture of asbestos cement pipes and other products, vinyl floor tiles and in brake and cloth lining

Asbestos cloth : it's a protective cover that insulates your body from external temperature

Sign & symptoms: interstitial fibrosis of the lungs, pleural thickening, calcification. Bronchogenic carcinoma, pleural and peritoneal mesothelioma progressive dyspnoea on exertion, cough, expectoration, chest pain, cyanosis and clubbing of the fingers

Diagnosis: asbestos bodies in sputum (asbestos fibres coated with fibrin), X-ray findings , ground-glass appearance in lower 2/3 rd lung

Clubbing is typical sign of asbestosis.

Progressive diseases

"prevention and periodic examinations"

Make the population aware of the asbestos disadvantages (educational prevention) and periodic examination.

Shutter

They usually present late and with carcinoma. when you take a biopsy it will show carcinoma secondary to asbestosis

How to differentiate between asbestosis and silicosis ?
Asbestosis will show a ground-glass on X-ray

Most of the causes comes with Bronchogenic carcinoma or mesothelioma.

Lead poisoning

Occupational usage (Industrial)	Non-occupational
Storage batteries, glass, ship building, printing and potteries, rubber	Gasoline, drinking water via lead pipes, paints, toys

Modes of absorption:

1. Inhalation of fumes and dust
2. Ingestion through food or drink.
3. Skin absorption: “tetraethyl lead”

Some kids have a bad habit of scrubbing the paint and licking it so they will get lead poisoning.

Drinking water that was contaminated by lead through lead coated pipes.
And warm water causes more erosion than cold water.

Clinical features:

70 microgram/ 100 ml .. clinical signs and symptoms:

- **Inorganic lead:** Plumbism*, Abdominal colic, Obstinate, constipation, Loss of appetite, Blue lines on the gums, Anemia, Wrist and foot drop
- **organic lead:** Headache, Insomnia, Mental, confusion and Delirium

*The gums turns to purple.

Lab diagnosis:

1. Coproporphyrin in urine (screening test).
2. Amino levulinic acid in urine.
3. Lead levels in blood and urine.

The inorganic lead is the one which causes abdominal symptoms. While, organic lead will hit the brain.

Prevention:

Substitution, Isolation, Local exhaust, ventilation, Personal protection, Periodic examinations, personal hygiene; handwashing and Health education.

Once the lead is in the body there are compounds that can excrete them, but if it’s damaging the nervous system it can't be taken out.

Who do we offer the screening test to ?
People who are working in that area or if a neighborhood has pipes high in lead coating and there are children who are drinking from that pipe we should provide the screen test to the whole neighborhood.

Occupational cancers

Carcinogenic agent	Organ affected
Arsenic	Skin and lung
Chromium compounds, hexavalents	Lung
Nickel	Lung and nasal sinuses
Polycyclic aromatic hydrocarbons	Skin
Coal tars	Skin, scrotum, lung, bladder
Benzol	Blood (leukaemia)
B-naphthalamine	Bladder
Ionizing radiation	Skin, bone, lung, blood (leukaemia)
Asbestos	Lung, pleura, peritoneum

Occupational dermatitis:

Causes:

Heat, cold, moisture, friction, pressure, x-rays, acids, alkalis, solvents, grease, tar, pitch, bacteria, fungi, leaves, vegetables, fruits.

Classification:

1. Primary irritants
2. Sensitizing substances.

Once you take the person away from the irritant the dermatitis will disappear. While, in Sensitizing substances even if you are removing that person from the acid or alkali they have to be sensitized so if they got it repeatedly it will turn to cancer.

Prevention:

1. Pre-selection
2. Protection
3. Personal hygiene
4. Periodic assessments

Pre-selection: If a person is irritated from any substance in a factory you should not accept him to work there

Radiation hazards:

Industrial exposures:

manufacture of radioactive paints, painting of luminous dials for watches, mining of radioactive ores, sand workers, x-rays rooms

Effects of radiation:

Acute burns, dermatitis, blood dyscrasias, malignancies, genetic effects.

Prevention:

Shielding in x-ray areas, monitoring 6 monthly, for their film badge or pocket electronic device, adequate workplace ventilation, replacement and periodic exams.

Pregnant ladies should not be allowed to work in the area

Prevention of occupational disease

Medical measures	Engineering measures
1. Pre-placement exams 2. Periodic examinations 3. Medical and health care services 4. Notifications 5. Supervision of working environment 6. Maintenance and analysis of records 7. Health education and counseling	1. Designing of the buildings 2. Good housekeeping 3. General ventilation 4. Substitution 5. Dusts 6. Enclose 7. Isolate 8. Local exhausts ventilations 9. Protective devices 10. Environmental monitoring 11. Research

Legislations	Policies and regulations for factories, work places, health of the workers eg insurance, sickness policies, disability benefits, etc

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"Summary"

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e.g. silicosis and asbestosis -

all of them are **Progressive diseases**

"prevention and periodic examinations

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Good luck!