



Introduction & diseases related to occupational health

● Objectives :

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

“Important for OSCE”

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● Resources :

Slides.

Doctor's notes.

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.
- You don't have to be in direct contact to the element to be affected, the working environment is sufficient to cause the disease

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

An example of Ergonomic is the wrist pad, those workers who sit in front of computer for a long time using the mouse are prone to develop carpal -tunnel syndrome

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 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 Important	Those are arranged here from maximal to lowest: Heat hyperpyrexia, exhaustion, syncope, cramps, burns you should be aware of these on Umrah, Hajj
Cold	Trench foot, frostbite Ex:Soldiers in boundaries
Light	Occupational cataracts, miners nystagmus
Pressure (pilots, submariners, divers)	Caisson disease, air embolism, blast (explosion)
Noise	Occupational deafness (Construction workers)
Radiation	Cancers, leukemias, aplastic anemia, pancytopenia
Mechanical factors	Injuries, accidents
Electricity	Burns (Those who work in repairing electrical towers)

Diseases due to chemical agents

We will focus more in pneumoconiosis
مرت على الجدول بسرعة

Gases	CO ₂ , CO, HCN, N ₂ ,NH ₃ ,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 (farmer's lung)
Metals and their compounds	Toxicity from Lead, mercury, cadmium, mercury, arsenic
Chemicals	Acids, alkalis, pesticides
Biological agents	Brucellosis, leptospirosis, anthrax, tetanus, encephalitis, fungal infections
Occupational cancers	Skin, lung, bladder
Occupational dermatosis	Dermatitis and eczema
Psychological origin	Industrial neurosis, hypertension, peptic ulcer.

Name some of the Occupational and work-related diseases ?

- asbestosis
- silicosis
- chemical poisoning
- infectious diseases (Health workers)
- radiation (x-ray department) , the longer the exposure the higher the risk to develop cancer
- chronic diseases, health workers are prone to stress

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**

A- Silicosis

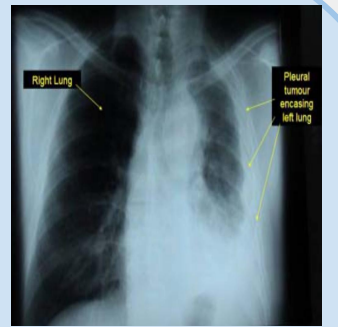
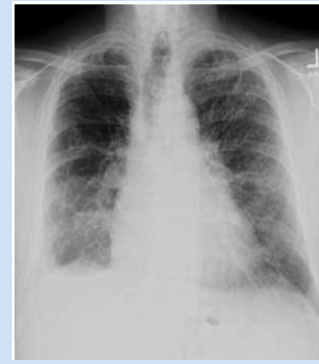
- Crystalline silica (SiO_2)
- **Occupations:**
 - mining (coal, mica, gold, silver, lead, zn) common in Saudi & south Africa
 - stone cutting and shaping, sandblasting (building and construction)
 - glass and ceramics manufacture
 - Iron and steel industry
- **Time to develop:** 7–10 years ●, sometimes less. Prolonged exposure to higher concentrations of dust
- **Presentation:** dyspnoea on exertion , **pulmonary tuberculosis** -if exposures high and the disease was missed -and cardiac or respiratory failure , **impaired TLC** (total lung capacity)
 - **Diagnosis:** x-ray**snow storm appearance** ●
 - **Progressive disease and converts to TB**
 - **“prevention and regular physical examinations ”**



Filaments like snow storm
Hazy appearance
Biopsy: silica fibers

B- Asbestosis

- Inhalation of asbestos fibres
- 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
- **Sign & symptoms:** interstitial fibrosis of the lungs, pleural thickening, calcification.
- **Bronchogenic carcinoma** what you will see on X-Ray? Round Calcification mostly in the mediastinal region, If we give you an X-Ray look at the mediastinum ● 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
- Progressive diseases
- “ prevention and periodic examinations”



Lead poisoning kids that eats pencils or paint

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



Modes of absorption

- Inhalation of fumes and dust

- Ingestion through food or drink

- Skin absorption “tetraethyl lead”

Lead poisoning

Workers in Aramco do screening every 6 Months for it

● Clinical features

- 70 microgram/ 100 ml.....clinical signs and symptoms other than that there is no symptoms

Inorganic lead:

- Plumbism
- Abdominal colic
- Constipation
- Obstinate constipation
- Loss of appetite
- Blue lines on the gums
- Anemia
- Wrist and foot drop if extreme only

organic lead:

- Insomnia
- Headache
- Mental confusion
- Delirium

● Lab diagnosis:

- Coproporphyrin in urine (screening test)
- Amino levulinic acid in urine
- Lead levels in blood and urine

● Prevention:

- Substitution Part of Ergonomic (Substitute the lead in the paint with substances not as toxic)
- Isolation Part of Ergonomic
- Local exhaust ventilation
- Personal protection masks gloves
- Periodic examinations personal hygiene; handwashing
- Health education

What if we have a contamination source?

- 1-Put enclosure around the source of contamination
- 2-suck the toxics directly from the source

Occupational cancers

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

She said : no need for the details and just read the last one

Occupational dermatitis

- **Causes:**

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

- **Classification**

- **Primary irritants**

- **Sensitizing substances**

- **Prevention:**

- Pre-selection
- Protection
- Personal hygiene
- Periodic assessments **annually/6M**

- History is sufficient to diagnose it
- Hx of asthma
- People who prone for Asthma are same as those who prone to dermatitis
- History of allergy is very important

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:** **assess every 6 months**

- 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

- History of exposure

1. Duration, How much exposure?
2. How big is the room that you work in?
3. Is there a fan where you work? (chemical fumes)
4. Is the door open where you work?
5. Is there humidifiers? (dermatitis) ,Recommend placing humidifier

Prevention of occupational disease

Medical measures

- Pre-placement exams
- Periodic examinations
- **Medical and health care services**
- **Notifications** reassure employee, rotation away from exposure (like those X-Ray workers)
- Supervision of working environment
- Maintenance and analysis of records
- Health education and counseling

Engineering measures

- Designing of the buildings
- Good housekeeping
- General ventilation
- Substitution
- Dusts
- Enclose
- Isolate
- Local exhausts ventilations
- Protective devices
- Environmental monitoring
- Research

Legislations

- Policies and regulations for factories, work places, health of the workers eg insurance, **sickness policies, disability benefits**, ect

MCQs

1-Which of the following causes an occupational accident?

- A) Lack of psychological support
- B) Working as truck driver
- C) Chemist
- D) A school teacher

2-The manifestations of occupational disease are related to:

- A) Time of Exposure
- B) Dose
- C) Immunity of patient
- D) A and B

3-Bagassosis is caused by:

- A) Iron
- B) Arsenic
- C) Asbestos
- D) Cane fiber

4-A 54 years old female came to the ER with abdominal colic, cold hand with pale skin and foot drop. The patient said that her husband works at making glazed pottery. Which of the following is first thing to start the management with?

- A) Ferrous sulfate
- B) Whole bowel irrigation
- C) 2,3-dimercaptosuccinic acid
- D) Measure blood level of lead