

Lead Poisoning

By Mrs. Rachel Roy*

EVERY NURSE working in an industry must have some knowledge of Industrial Toxicology, and should be familiar with the chemicals and metals used in the factory where she is employed.

Some metals have been in use much longer than others and a good deal is known about their toxic effects. A metal may enter the tissues without acting as a poison. A metal or a compound of a metal may have different effects according to the situations e.g. (i) when it exists in organic or inorganic form, (ii) when it is a solid, liquid or a gas or (iii) when it falls upon the skin or enters the body through the respiratory or alimentary tract.

Lead poisoning in industry may occur in two forms *viz.* (i) exposure to inorganic compounds of lead or (ii) from handling organic compounds. The clinical picture is different in the two forms. Lead has been in use at least for 6,000 years. It is a bluish grey metal, heavy and ductile. Bright lead is not dangerous to handle, but exposed to air it readily becomes coated with a film of oxide. This creates dusts which is inhaled by men who handle them. Further lead volatilizes at higher temperature and all lead-melting and lead-burning jobs are hazardous.

Metallic lead is used in many industries such as in the manufacture of motor cars, accumulators, red paint, shipbuilding, pottery and battery.

Absorption

It is absorbed through food and drink or through inhalation of the dust and fumes. Lead is a cumulative poison and the time required for poisoning depends upon the amount absorbed, duration of exposure, susceptibility of the individual, and ratio between the rate of absorption and excretion. It is a common constituent of soil

and its presence in traces in human body is not unusual. Lead taken by mouth is mostly excreted. A small portion which is absorbed reaches liver and the most of it is returned to intestine in the bile. Lead absorbed through the respiratory tract on the other hand reaches the circulation directly. When absorption is slow and continuous lead is deposited in bones where it causes no symptoms. The metabolism of lead runs parallel to that of calcium and so any illness causing a reverse in the calcium metabolism will allow the lead to come out of the bones in large amount giving rise to clinical symptoms of lead poisoning.

Signs and Symptoms

Hippocrates (370 B.C.) described a severe attack of colic in a man who extracted metals and was probably the first to recognize lead as the cause of symptoms. A

distinction must be made between lead absorption and lead poisoning.

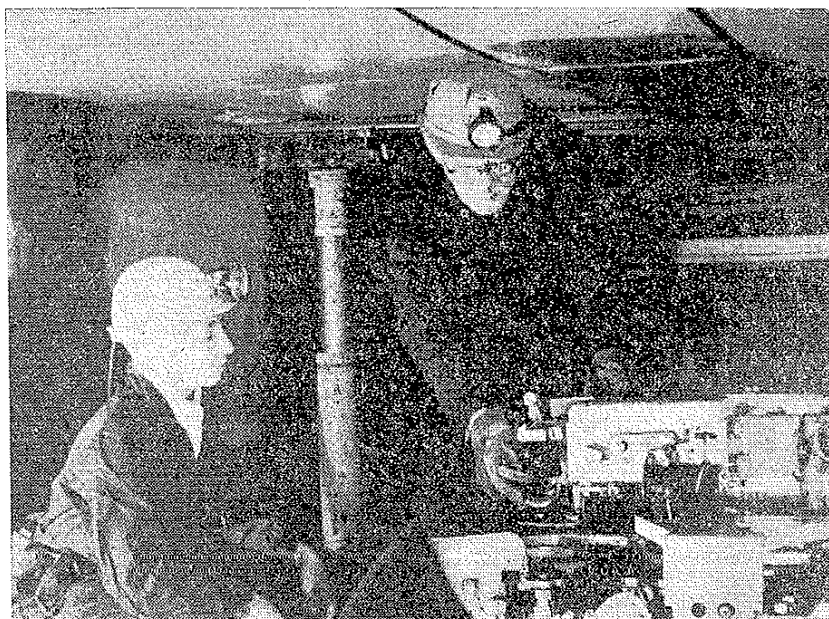
In early stages there may be no symptoms. Later the patient complains of vague ill-health, fatigue, head-aches, loss of appetite, constipation and disturbed sleep. Patient will feel better when he is away from lead for a short period. Basophil count increases and there will be a fall in haemoglobin percentage. He may complain of pain in the bones and joints without any pathology. Main symptoms appear one after another or separately.

Manifestations

(1) **Intestinal Colic** is the commonest manifestation and is preceded by constipation, headaches and loss of appetite. Pain is situated around or below the umbilicus. Patient becomes cold, pale and drenched with perspiration. Vomiting may occur at the onset of pain and lasts till the pain subsides. Pain is due to action of lead on smooth muscles.

(2) **Paralysis** follows colic, particularly with severe or repeated exposure. Wrist drop is the commonest form, which begins on the right side in a right handed person and later on becomes bilateral.

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An Industrial Nurse goes underground to inspect the working of a piece of machinery for health hazards in a coal mine in the United Kingdom

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