Transformer oil is one kind of highly refined oil which is used as coolant and heat exchanger in transformers. It contains some toxic compounds known as 2,3,7,8-tetrachlorodibenzo[p]dioxin (TEF). In addition, it acts as oil to water heat exchanger and serves as insulator and coolant for heavy duty electrical transformers. Besides serving as insulator and coolant, it acts as a safety device for heavy duty electrical transformers.

Individuals can be exposed to PCBs through breathing or swallowing. Most PCBs are tasteless, odourless, clear to pale yellow in colour. They have high fat solubility but low water solubility. The main constituent of transformer oil is PCBs which are degraded technical PCB mixture. They also developed more than 2000 clinical cases of intoxication by heat exchange system in the transformer manufactory.

Most PCBs are tasteless, odourless, clear to pale yellow in colour. They have high fat solubility but low water solubility. The main constituent of transformer oil is PCBs which are degraded technical PCB mixture. They also developed more than 2000 clinical cases of intoxication by heat exchange system in the transformer manufactory.

PCBs are highly lipophilic in nature. They are easily absorbed by the person's body adipose tissue or other organs for long time. They are also present in the environment in large quantities. PCBs are present in the atmosphere, drinking water, sediment, soil and plants. They also found in our diet. PCBs are passed through breast milk from mothers to children. They can also be found in the human placenta and in the liver.

Individuals can be exposed to PCBs through breathing or swallowing. Small doses of PCB have no significant effects, but large dose may cause acute poisoning. Besides these, in long term exposure, small dose may cause chronic poisoning. PCBs are neurotoxic, genotoxic and carcinogenic in nature. They can cause hepatotoxicity, neurotoxicity, endocrine disruption and inhibition of hepatic function and dermal lesions.

PCBs can cause hepatotoxicity and neurotoxicity. Study suggests that it can cause hepatotoxicity and neurotoxicity. Here we present a case report of transformer oil poisoning.

Case report
A 4-year-old girl presented to us with nausea and vomiting. Patient's mother informed us that the patient accidentally ingested transformer oil. On physical examination, she had jaundice, tachycardia, tachypnoea, and abdominal distension. Her respiration was supported with mechanical control ventilation. Gradually, her condition improved, and next day she was withdrawn from ventilator mode ventilation.

Her laboratory investigations showed the following:
- SGPT was 107 U/L
- SGOT was 106 U/L
- Total Bilirubin was 2.0 mg/dl
- Direct Bilirubin was 1.7 mg/dl
- Creatinine was 57 µmol/L
- BUN was 6.4 mmol/L
- Blood sugar was 90 mg/dl
- Sodium was 140 mmol/L
- Potassium was 5.4 mmol/L
- Chloride was 110 mmol/L
- Bicarbonate was 11.8 mmol/L
- BEb (base excess in blood) was -5.2 mmol/L
- BEecf (base excess in extracellular fluid) was -6.4 mmol/L
- pH was 7.39
- EKG showed sinus tachycardia
- Chest radiography revealed haziness and increased vascularity of both lung fields.

Follow-up examination:
A second follow-up was ensured after one month and found haemodynamically stable and there were no signs of respiratory distress. Patient's symptoms were improved and her condition was found to be normal. Follow-up examination was done two months later and she was asymptomatic.

Discussion
Transformer oil poisoning is a rare type of chemical poisoning. Acute poisoning occurs usually due to ingestion or exposure to PCBs. Most PCBs have no significant effects, but large dose may cause acute poisoning. Small doses of PCBs have no significant effects, but large dose may cause acute poisoning.

Cases of transformer oil poisoning have been reported worldwide. In Japan, there have been cases of 'Yucheng accident' (Yusho is "rice oil" disease in Japanese) in the 1960s due to PCB exposure. In the USA, there have been cases of 'Seveso accident' in the 1970s due to PCB exposure. In Europe, there have been cases of food poisoning due to PCB exposure in the 1980s.

In conclusion, PCBs are highly toxic and can cause hepatotoxicity, neurotoxicity, endocrine disruption and inhibition of hepatic function and dermal lesions. Follow-up examination is important to monitor the patient's health and to detect any adverse effects.

References:
is stable at high temperature. It has excellent electrical properties as 2,3,7,8-tetrachlorodibenzo[p]dioxin (TEF). A Food additive, it is used in the manufacture of plasticizers, voltage capacitors, switches and circuit breakers. It is also used in fluorescent lamp ballasts and some types of high-voltage transformers. It is used in oil-filled transformers, which are commonly used in electrical power generation and transmission.

Polychlorinated biphenyls (PCBs) are organic, chemical compounds of 2–10 chlorine atoms attached to biphenyl molecule composed of two benzene rings. The chemical formula of PCB is C12H10-C12H10Cl2-n, where n represents the number of chlorine atoms in the molecule. PCBs are a group of about 209 different compounds, each with slightly different properties.

PCBs are persistent environmental pollutants that can accumulate in the adipose tissue of animals and humans. They are known to be toxic and can cause reproductive, developmental, immune, and neurological effects. They have been associated with a variety of adverse health effects, including neurological disorders, reproductive problems, and cancer.

Exposure to PCBs can occur through ingestion, inhalation, or dermal absorption. The most common source of exposure is through the environment, particularly contaminated soil and water. PCBs are also used in certain products, such as transformers, capacitors, and electrical equipment.

Clinical features of PCB poisoning can be chloracne, skin rashes or sores, ocular lesion, irregular menstrual cycle, and neurotoxicity. In pregnant women, it may lead to abortion or miscarriage. Headache, nausea, vomiting, irritation to skin and eye, and short term memory loss are also common.

Her arterial blood gas (ABG) analysis showed pH 7.45, pO2 219 mm Hg, pCO2 12.6 mm Hg, TCO2 12.2 mmol/L. Her BEecf (base excess in extracellular compartment) was 6.4 mmol/L, BEicf (base excess in intracellular compartment) was 13.8 mmol/L, pH was 7.45, pO2 was 219 mm Hg, and pCO2 was 12.6 mm Hg. Her absolute indices of RBCs were MCV 91.6 µmol/L, MCH 31.7 pg, MCHC 33.2 g/dL and hematocrit was 34%. Absolute indices of WBCs were WBC 95.6 fL, MCH 31.7 pg, MCHC 33.2 g/dL and hematocrit was 34%. Her ECG showed sinus tachycardia. Her chest radiography showed no significant abnormality. Her liver function test was normal.

Polychlorinated biphenyls (PCBs) are persistent environmental pollutants that can accumulate in the adipose tissue of animals and humans. They are known to be toxic and can cause reproductive, developmental, immune, and neurological effects. They have been associated with a variety of adverse health effects, including neurological disorders, reproductive problems, and cancer.

Discussion

The patient was discharged home after 3 days and was advised to avoid further PCB exposure. For acute exposure, skin rash or scab formation is seen. Pain relief can be achieved with aspirin, paracetamol, and ibuprofen. For controlling infusion vomiting, one can use metronidazole in injectable form, oral cytoprotective agents like ranitidine, or magnesium hydroxide and ranitidine in combination provide relief. For neurological symptoms, anti-epileptics can be used. For chronic exposure, one can use antioxidants like vitamin C and E.

There is history of PCB intoxication in large scales. Taiwan in 1979. In Japan, famously known as ‘Yusho accident’ (Yuchang is “oil disease” in Chinese) involved at least 1788 and in China the ‘Yucheng’ accident involved 20000. Another ‘cooking oil’ disaster occurred as an epidemic in France in 1995. In Japan, famous as Yusho disease (also known as Yucheng accident) involved at least 1788 and in China the Yucheng accident involved more than 20000 clinical cases of intoxication by heat exchange system in the factory. In the US, similar type of accidents were reported in 1970s. In Taiwan in 1979, there were more than 20000 cases of Yusho disease which was confirmed as PCB intoxication. In Japan in 1997, there were more than 25000 cases of Yusho disease which was confirmed as PCB intoxication.

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Discussion

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References

Case Report

Polychlorinated Biphenyls (PCBs) are synthetic organic chemicals that were once widely used in transformers, capacitors, electrical insulators, and other industrial applications due to their heat-resistant and electrical insulating properties.

PCBs, however, have several usages, one of which is transformer oil; PCB toxicity; Transformer oil poisoning. Despite their initial benefits, PCBs have several drawbacks, including being tasteless, odourless, clear to pale yellow, and non-flammable. They have been classified as a potential carcinogen, and their desirable characteristics in the environment have led to their widespread use and accumulation in the environment.

PCBs are highly lipophilic and can accumulate in the fatty tissues of humans and animals. They can be ingested via the diet, inhaled in the workplace, or absorbed through the skin. Once PCBs enter the body, there is no way to eliminate them from the body. They are stored in the fatty tissues of the body and can be released slowly over time to cause chronic toxicity.

PCBs are metabolized in the liver, and the metabolites are excreted in the urine and bile. Small doses of PCBs have no significant effects, but chronic exposure can cause serious health problems, including liver damage, kidney damage, reproductive problems, and neurotoxicity.

In the long run, chronic exposure to PCBs can cause liver cirrhosis, liver cancer, kidney damage, reproductive problems, and neurotoxicity. In the short term, PCBs can cause headaches, nausea, vomiting, and irritation to skin and eye.

The chemical structure of PCB is C12H10-5.

PCBs are a concern because they accumulate in the environment and can be ingested by humans and animals. They are persistent in the environment and can be transported long distances by air and water.

In this case report, we present the case of a patient who ingested PCBs and developed acute fatal symptoms.

Fig 1. Chemical structure of PCB

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The patient, a 2-year-old girl, was admitted to the emergency department after ingesting PCB-laden transformer oil. She was found to be in a semi-conscious state and had symptoms of respiratory distress, including tachypnea, cyanosis, and rhonchi.

On examination, she was found semi-conscious, with poor respiratory effort and increased heart rate. Her Glasgow Coma Score (GCS) was 8. She was immediately intubated and placed on mechanical ventilation. She required invasive mechanical ventilation for 3 days and was on continuous positive airway pressure (CPAP) for 2 days.

The patient had a diagnosis of acute respiratory distress syndrome (ARDS) caused by PCB toxicity. She was treated with assisted ventilation, inhaled nebulized salbutamol, metronidazole in injectable form, oral cytoprotective agent, furosemide for three days, and injectable furosemide for three days.

Laboratory investigations revealed haziness and increased vascularity of both lung fields. The patient's arterial blood gases showed hypoxia (pO2 219 mm Hg) and hypercapnia (pCO2 12.6 mm Hg). Her hemoglobin was 7.581 g/dL, hematocrit was 22%, and platelets were 200,000/µL. Her white blood cell count was 11,000/µL with a differential of 79% neutrophils, 0.9% eosinophils, 10% lymphocytes, and 0.1% basophils. Her absolute indices of RBCs were MCV 7.581, pCO2 12.6 mm Hg, pO2 219 mm Hg, TCO2 12.2 mmol/L, HCO3 11.8 mmol/L, BEb (base excess in blood) was -2.6 mmol/L.

The patient had a history of chronic respiratory disease and was on treatment with metronidazole, omeprazole, ondansetron, and a generation cephalosporin. She was also on a ventilator strategy of either CPAP or mechanical ventilation for several days. The patient was then discharged home after 3 days and was advised to continue with home oxygen therapy and follow-up examinations with particular attention to respiratory symptoms.

In conclusion, PCB toxicity is a serious health concern that can cause acute and chronic health problems. Early recognition and appropriate management are crucial for the survival of patients exposed to PCBs.

References:


A 16-Year-Old Lady with Transformer Oil Poisoning in Intensive Care Unit - A Case Report

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Key words: Transformer oil; PCB toxicity; Transformer oil poisoning

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Transformer oil is a synthetic viscous liquid used in electrical transformers. Its main constituent is polychlorinated biphenyl (PCB), an organochlorine compound.

PCB is a synthetic organic compound of 2–10 chlorine atoms in the biphenyl structure. It is a colorless, transparent, highly viscous liquid with a glassy appearance.

PCB is a highly toxic compound that can accumulate in the body over time. It can cause a variety of health problems, including liver damage, kidney damage, and endocrine disruption.

A 16-year-old housewife hailing from Ghurat, Ashulia, Dhaka was admitted to a local community-based hospital with nausea and several episodes of vomiting. After two hours of admission she developed respiratory distress and subsequently was referred to Enam Medical College Hospital for better follow-up examination.

On admission, she was conscious, her Glasgow Coma Score (GCS) was 15, blood pressure was 110/70 mmHg, pulse rate was 100 beats per minute, and respiratory rate was 22 breaths per minute.

Her respiration was supported with mechanical control and follow-up examinations with particular attention to observe further symptoms. Chest X-ray was normal.

Her arterial blood gas (ABG) analysis showed pH 7.38, PaO2 (partial pressure of oxygen) 99.9%, PaCO2 (partial pressure of carbon dioxide) 35.1 mmHg, HCO3 - (bicarbonate) 11.8 mmol/L, BEb (base excess in blood) -6.8 mmol/L, BEce (base excess in extracellular fluid) 5.7 mmol/L, Hct (hematocrit) 38%, WBC (white blood cell count) 8000/mL.

Her initial laboratory results were: sodium 139.3 mmol/L, potassium 3.31 mmol/L, chloride 109.8 mmol/L, bicarbonate 24.2 mmol/L, creatinine 57 μmol/L, SGPT 107 U/L, SGOT 100 U/L, and serum creatinine 57 μmol/L.

Her respiration was supported with mechanical control and injectable furosemide for three days. After two days of supportive treatment, she was then discharged home after 3 days and was advised to consult a psychiatrist.

One week later she was referred to a local government medical college for follow-up examination. She was managed efficiently through conservative treatment along with medical consultation.

For instance, it's immediate adverse effects are rash or sores, ocular lesion, irregular menstrual cycle, skin irritation, and gastrointestinal symptoms. For long-term effects, the symptoms are endocrine disruption and inhibition of estrogen and estradiol which may lead to serious developmental problems in children.

It was noted that high PCB levels were found in her blood and urine, indicating exposure to PCB. She reported consuming a small amount of transformer oil as a suicidal attempt.

No specific treatment exists for PCB accumulation and PCB poisoning. In the case of acute exposure, skin rashes or sores should be avoided, and skin abrasions should be covered with a nonabsorbent dressing.

For acute exposure, skin rashes or sores should be avoided, and skin abrasions should be covered with a nonabsorbent dressing. For chronic exposure, individuals should consult a doctor to determine the appropriate treatment.

It is important to avoid further PCB exposure. For acute exposure, skin rashes or sores should be avoided, and skin abrasions should be covered with a nonabsorbent dressing.

It is also important to monitor the patient's health regularly and consult a doctor if there are any symptoms of PCB toxicity.

In conclusion, transformer oil poisoning is a rare type of chemical poisoning. It can cause a variety of health problems, including liver damage, kidney damage, and endocrine disruption.

Individuals can be exposed to PCBs through breathing air or eating food that contains PCBs. It is important to avoid further PCB exposure and consult a doctor if there are any symptoms of PCB toxicity.

References


3. An outbreak in Spain in 1981 which was the most publicized event of this kind.

4. Another 'cooking oil' disaster occurred as an epidemic in Taiwan in 1979. In Japan, famously known as 'Yusho disease' which was the worst epidemic.

5. There is no antidote for PCB and no specific measures to remove it. It will be slowly eliminated naturally.

6. PCB is not widely seen in medical practice. However, there is history of PCB intoxication in large scales.

7. It can also be excreted through breast milk.

8. It can also cause endocrine disruption and inhibition of estrogen and estradiol which may lead to serious developmental problems in children.

9. It is important to avoid further PCB exposure. For acute exposure, skin rashes or sores should be avoided, and skin abrasions should be covered with a nonabsorbent dressing.

10. It is also important to monitor the patient's health regularly and consult a doctor if there are any symptoms of PCB toxicity.

11. For chronic exposure, individuals should consult a doctor to determine the appropriate treatment.

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17. Taiwan in 1979. In Japan, famously known as 'Yusho disease' which was the worst epidemic.

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