

Intoxication with methyl bromide during unloading containers

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Use of methyl bromide

- a fumigant in agriculture
- a fumigant during bulk transport of grains in trains and ships
- a fumigant in sea containers

Toxic effects of methyl bromide

Lloyd Davies, Br J Ind Med 1947:

Since 1899 28 fatal and 150 non fatal cases in the chemical industry, fire extinguishers and fumigation

Alexeeff and Kilgore, Residue Reviews 1983:

More than 950 fatal cases

Toxicology methyl bromide

- MAC (Netherlands) 5 ppm , acrid chloroform-like smell > 500 ppm
- Adverse health effects > 25 – 100 ppm
- Immediate or delayed (> 1 h) symptoms
- CNS, pulmonary, gastrointestinal and renal effects
- Half-life in humans < 2 hours?
- DX detailed history, Lab: bromide or methyl bromide concentration

Ban on methyl bromide

- Treaty of Montreal:
Ban on the use in agriculture
- European Union, 2010:
Ban on total use , however exceptions:
use as fumigant for stow wood in sea
containers allowed until 2015

Case A and B (1)

Two 38 y old males have been unloading sea containers with glass panes for 6 months

Both workers develop health complaints:

A : headache, transpiration, irritated eyes and throat, blurred vision, dyspea and frequent epistaxis

B : headache, irritated eyes and throat, tiredness

Case A and B (2)

Acute incident :

A (front) and B (back) are unloading a container

A rapidly develops headache, transpiration, irritated eyes and throat, blurred vision, dyspea, dizziness and vomiting

B is found unconscious in the back

A helps B out of the container and loses consciousness also

Case A and B (3)

A and B are admitted to the ICU with generalized seizures and respiratory insufficiency

After 4 days they are moved to the general ward.

Ten days later they are discharged from the hospital

Case A (4)

After discharge health complaints persist :

- Generalized seizures and peripheral neuropathy
- Agitation and personality changes
- Dyspnea
- Visual disturbances

After 7 years peripheral neuropathy, agitation and personality changes still exist

Case B (4)

After discharge health complaints persist :

- Generalized peripheral neuropathy
- Depression, personality changes and neuro-cognitive defects
- Visual disturbances
- Absence of smell and taste

After 7 years all the above complaints still exist

Case C (1)

A 44 y old female truckdriver opens the doors of the transported container: there is a strange smell, she develops an irritated throat, dry mouth, headache, dizziness, slurred speech, decrease in consciousness and is unable to stand

She is transported to the ER

Case C (2)

Observation at the ER :

- decreased consciousness
- slurred speech (non-understandible)
- some retrograde amnesia, short memory disturbances
- generalized neuropathic pain

Discharge after several hours with persisting amnesia and neuropathy

During the following weeks development of agitation, personality changes and neuro-cognitive disturbances

Case C (3)

After 1 year the following complaints persist :

- Neuro-cognitive disturbances
- Agitation and personality changes

Working conditions

- In case A and B the presence of methyl bromide in the containers had been known all the time. No safety measures had been advised.
- In case C no signs of fumigation on the container or in the freightletter were present. Following investigations by the Inspectorate it turned out that the container had been fumigated with methyl bromide

Conclusion

- Methyl bromide is a toxic substance with lethal and persisting non-lethal effects
- Based on this assumption the use of methyl bromide is forbidden in the “western world”
- There is no justification for the exception in the EU for ongoing use of methyl bromide for insect control of stow wood

Future

Given the toxicity of methyl bromide and the option of non-toxic alternatives for insect control of stow wood no reason exists to continue the use of methyl bromide in container transport