Methanol poisoning

Why in news?

Recently around 20 people died after consuming spurious liquor in Villupuram and Chengalpattu districts of Tamil Nadu.

What is the difference between liquor and spurious liquor?

- **Liquor** – It is an *alcoholic beverage made by distillation* rather than by fermentation.
- The alcohol content varies from the *5% or so (beer) to 12% or so (wine) to 40% or so (distilled spirits)* by volume.
- The alcohol used is almost always ***ethanol (C_2H_5OH),*** a psychoactive drug that, in low doses, reduces the level of neurotransmission in the body, leading to intoxicating effects.

Beverage	Alcohol content
Beer	5% or so
Wine	12% or so
Distilled spirits	40% or so

- **Spurious alcohol** – It is an illicit liquor made up by *improper distillation.*
- It is a liquid mixture containing ***methanol (CH_3OH) as well ethanol***.

What is methanol and how is it regulated?

- **Methanol –** It is a colorless, fairly volatile, flammable liquid with a faintly sweet pungent odor like that of ethyl alcohol.
- It is primarily used as an industrial solvent and as antifreeze.
- Methanol is also used as an alternative motor fuel and as an ingredient in paint and varnish removers.
- **Regulations** - The *Food Safety and Standards (Alcoholic Beverages) Regulations 2018* stipulate the maximum permissible quantity of methanol in different liquors.

Liquor	Maximum permissible quantity of methanol (grams per 100 litre)
Coconut fenny	Absent
Country liquor	50
Pot-distilled spirits	300

- *Schedule I of the Manufacture, Storage and Import of Hazardous Chemical Rules 1989* includes methanol.
- *The Indian Standard IS 517* applies to how the quality of methanol is to be ascertained.
- Ministry of Chemicals and Fertilizers has notified *Quality Control Order* for the

mandatory certification for methanol that shall come into force on the 3rd August, 2023.

*The human body contains minute quantities of methanol (**4.5 ppm** in the breath of healthy individuals) as a result of eating some fruits.*

*For an adult, **more than 0.1 ml** of pure methanol per kilogram of body-weight is dangerous.*

What is methanol poisoning?

- **Methanol poisoning** - The deadliness of spurious liquor arises from methanol due to its conversion into ***formic acid.***
- The accumulation of formic acid over time leads to a baneful condition called *metabolic acidosis.*
- Acidosis can lead to *acidemia* when the blood's pH drops below its normal value of 7.35.
- Methanol-poisoning can cause blindness, cerebral edema, haemorrhage, and death.
- **Treatment** - There are 2 immediate ways to treat methanol poisoning.
    - To administer *ethanol of a pharmaceutical grade* by healthcare workers
    - To administer an antidote called *fomepizole* (that is present in WHO's list of essential medicines)

Quick facts

WHO's Lists of Essential Medicines
• Essential medicines, as defined by the WHO, are the medicines that satisfy the priority health care needs of the population. • These are the medications to which people should have access at all times in sufficient amounts and the prices should be at generally affordable levels. • The lists are updated **every 2 years** by the ***Expert Committee*** on Selection and Use of Essential Medicines. • The current versions, updated in 2021, are the 22nd Essential Medicines List (EML) and the 8th Essential Medicines List for Children (EMLc).

References

1. The Hindu | spurious liquor and methanol
2. WHO | WHO Model Lists of Essential Medicines

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