Sarin Gas: Too Heinous Even for War
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Introduction:

What is It?
Sarin gas (military designation GB), is one of the most dangerous and toxic chemicals known. It belongs to a class of chemical weapons known as nerve agents, all of which are organophosphates, it’s colorless, odorless.1

Synthesized
Developed in Nazi Germany by a team of German scientists lead by the german chemist Gerhard Schroeder seeking a tougher pesticide.2 Hoping to make progress in the fight against hunger in the world.3

First Use
1938
The ethnic Kurd city of Halabja in northern Iraq (population 70,000) was bombarded with chemical bombs at the end of the Iran-Iraq war, which included sarin. Figures for the final total of dead range from 3,200 people to 5,000.4

1988
March 16
The Halabja massacre was caused by the use of Sarin nerve gas and several other toxic compounds.5

Mechanism of Action:

HEALTHY SYSTEM
Nerve cells carry information by sending electrochemical impulses to the muscles and organs

SARIN
is a colorless liquid of organophosphate which is absorbed into the blood and acts at the post synaptic membrane of the synaptic cleft causing a rapid paralysis.

Neurotransmitter
with receptor
Neurotransmitter
is released
Enzyme
Leading to a buildup of acetylcholine in the synaptic cleft, so that any nerve impulses are effectively continually transmitted.

Part symmetrical
Impulse
Mildly exposed people usually recover completely. Severely exposed people are less likely to survive.5

Health effect:

Symptoms
occurring within seconds to hours of exposure
SLUDGE syndrome:
- Salivation.
- Lacrimation.
- Urination.
- Diarrhea.
- Gastrointestinal distress.
- Emsias: Vomiting.
- Miosis.
- Muscle spasm.
- Exposure to large doses result in:
  - Convulsions.
  - Paralysis.
  - Respiratory failure (due to bronchorrhea and bronchospasm).7

Long-term
Mildly exposed people usually recover completely. Severely exposed people are less likely to survive.5

Recent uses as a weapon:

- On March 19, 2013: a chemical attack in Khan al-Asal Aleppo, Syria resulted in at least 124 wounded persons and killed 20.6
- On August 21, 2013: sarin was used in an attack in the Ghouta region of the Rif Dimashq, Syria death toll range from at least 281 people to 1,729.7
- On April 4, 2017 Khan Shaykhun in Idlib Governorate, Syria8 sarin gas was released during an airstrike by Bashar Al-Assad forces. at least 74 people killed and more than 557 who were injured.9

Conclusion:

- Sarin is a highly toxic invisible, synthetic organophosphorus compound.
- Classified as a nerve agent because of its poisonous effects on the body’s central and peripheral nervous systems.
- It binds to AChE inhibiting it from hydrolysing ACh thus accumulation of ACh.
- Leading to unwanted repeated muscle contraction.
- It’s deadly due to asphyxia.
- Sarin, like all chemical weapons, is banned under international law.

References:

4. Available at: http://www.bbc.co.uk/uk/telegraph/uk_uk/specials/march-18/01/newstext_43944840/43944832.onlinetext.2017.11.1

Management:

Decontamination:
- Remove & dispense of contaminated clothing As quickly as possible.
- Wash skin with large amounts of soap and water.
- Rinse the eyes with water for 10 to 15 minutes.

Antidotes:
Atropine and Pralidoxime.20