**Warning in relation to 2,4-dinitrophenol DNP consumption Announcement Displayed From : Tuesday, June 2, 2015 - 21:18 2,4-Dintrophenol slimming aids – Information for IHR NFPs**

The chemical 2,4-dinitrophenol is sold over the Internet as a slimming aid for dieters (including those who are suffering from eating disorders or body dysmorphia) and body builders. This industrial chemical has caused cases of severe illness and deaths in multiple countries in the last 2-3 years. This announcement is triggered by the report of a death in the United Kingdom following the use of a product containing 2,4-dinitrophenol.  As a result of this death and other evidence of the continuing sale of products containing 2,4-dinitrophenol, on 29 April 2015 Interpol issued a global alert, in the form of an Orange Notice warning, to law enforcement agencies in 190 countries[1].

The purpose of this announcement is to alert NFPs and to encourage national authorities to take the necessary steps to protect the public from harm associated with products containing this chemical.

2,4-dinitrophenol (DNP)

DNP, which is identified by the chemical abstracts service (CAS) number 51-28-5, can be used in the manufacture of munitions, as a herbicide, and in the manufacture of dyes, wood preservatives and photographic chemicals. DNP is a yellow, crystalline powder that is slightly soluble in water[2]. It is also chemically unstable.

In the 1930s it was discovered that DNP increases metabolic rate and induces weight loss, leading to its use as a slimming drug. The high incidence of severe adverse effects and deaths resulted in the prohibition of its medical use in the USA under the Federal Food, Drug and Cosmetic Act of 1938.  DNP has also been banned as a weight-loss drug in the UK[3].

While DNP is not a licensed drug, it is still widely sold over the Internet under a variety of names. Websites often refer to the chemical as a ‘fat burner’, implying its suitability for human consumption, even if the same website also publishes a disclaimer about the dangers of ingesting this chemical. The fact that a product contains DNP will not always be mentioned on the website or product label1.  Some of the websites selling the products purport to be pharmaceutical companies or claim to make products to GMP standards.  Since, however, there is no regulatory control of the manufacture of products containing DNP, or in the jurisdictions where it is sold, there is no guarantee whatsoever of the quality and purity of the chemical.

DNP is sold as a yellow powder or crystals, in capsules, and as a cream. Typical quantities of DNP contained in capsules are 100 to 250 mg, and some websites sell the powder in bulk.

Toxicity of DNP

Websites recommend the use of doses of 100 to 400 mg per day, usually building up to the higher dose over time. Websites might also suggest the concomitant use of thyroid hormone and/or anabolic steroids2.  The toxic dose is variable. The lowest published lethal dose is 4.3 mg/kg and other doses reported as being lethal range from 2.8 to 5g.2 Conversations around the most suitable dosing ‘cycles’ are noted in online discussion fora linked to bodybuilding.

DNP is absorbed by ingestion, inhalation and through the skin3. It acts by uncoupling oxidative phosphorylation and stimulating glycolysis2.

The most common side effect associated with the use of DNP is a rash. Other adverse effects reported include peripheral neuritis particularly affecting the hands, gastroenteritis and anorexia, agranulocytosis and neutropaenia, cataracts, permanent deafness and yellow discolouration of the skin, sclera and urine.

Toxic effects include confusion, agitation, coma, convulsions, hyperthermia, tachycardia, sweating and tachypnoea and cardiovascular collapse.  Hyperthermia may be severe and life-threatening, and body temperatures exceeding 40° C have been reported2.  Changes found at post-mortem include heart muscle damage and acute tubular necrosis2 .

Treatment of poisoning2

There is no antidote for poisoning with DNP and management involves symptomatic and supportive care with particular attention to monitoring body temperature, cardiac rhythm, heart rate and oxygen saturation. A range of measures may be used to correct hyperthermia including external cooling measures, benzodiazepines and dantrolene. The advice of a poisons centre should be sought for detailed management advice.

Action by public health authorities

WHO suggests that public health authorities take the following actions:

1. Provide warnings to the general public through websites, the mass media and social media that products containing DNP should not be taken, ingested or applied to the body since they are toxic.

2. Alert medical personnel, poisons centres and pharmacists about these products and request notification of cases of adverse effects to the appropriate health authority.

[1] <http://www.interpol.int/News-and-media/News/2015/N2015-050>

[2] International Chemical Safety Card No 464: 2,4-dinitrophenol <http://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0464>

[3] Grundlingh J et al (2011). 2,4-Dinitrophenol (DNP): A Weight Loss Agent with Significant Acute Toxicity and Risk of Death. J Med Toxicol 7(3): 205-212 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3550200/>