The 'New Psychoactive Substances'

The Current Situation on the Maltese Islands from the Laboratory Point of View

1. INTRODUCTION

One of the worst revolutions in illicit drug misuse took place with the development of synthetic drugs. These are drugs that are created using man-made chemicals rather than natural ingredients. Such drugs are not a new phenomenon and have been around since the 1960s when *d-lysergic acid* (LSD) became popular. This was followed by the growing popularity of Ecstasy or MDMA (*3,4-methylenedioxymethamphetamine*) some 20 years later, in the 1980s. These are just two of the many synthetic drugs which exist and, in a way, these first synthetic drugs of misuse can be considered as a prelude to the hundreds of new synthetic drugs that would surface in the years which followed.

Despite being known also as 'designer drugs', 'herbal highs', 'bath salts', and 'legal highs', the preferred term as adopted by the European Community in 2005 is 'new psychoactive substances' (NPSs). They are defined as 'Narcotic or psychotropic drugs that are not scheduled under the United Nations 1961 or 1971 Conventions, but which may pose a threat to public health comparable to scheduled substances'. The word 'new' is not because these are newly synthesised substances, since nearly all of the substances encountered were first synthesised years ago, but merely refers to being newly misused. Their aim is to mimic the effects of the 'traditional' drugs such as cannabis, heroin and cocaine and can be distinguished from the 'traditional' drugs of misuse because, with some exceptions, NPSs have no history of medical use. These substances are also frequently labelled as 'not for human consumption' to try and elude customs drug controls.

2. CURRENT SITUATION ON THE MALTESE ISLANDS

The illicit drug situation has gone through a lot of changes during the past 20 years, not only on the Maltese Islands but also worldwide (Figure 1). This because, 20 years ago, drugs were 'simpler', less potent, and relatively easier to identify. Back then, brown powder was usually heroin, white powder usually cocaine, while green leaves were cannabis, and pills were ecstasy. However today with the phenomena of the new psychoactive substances, this is no longer the case. The brown powder is not always heroin, and neither is the white powder always cocaine. Even green leaves and pills cannot be taken for granted that they are cannabis and ecstasy respectively. NPSs are being sold as alternatives to 'traditional' drugs or sometimes mixed with 'traditional' drugs, therefore not only causing challenges analytically but also to first responders, who may not know the identity of the drug at the scene of the crime.

Figure 2 depicts the current situation on the Maltese Islands. There are currently 2 major types of synthetics we are seeing. These are the ***synthetic cannabinoids*** which mimic the effect of cannabis and the ***synthetic cathinones*** which mimic the effect of cocaine and ecstasy, with the former being more predominant. They consist of 100s of different man-made chemicals.

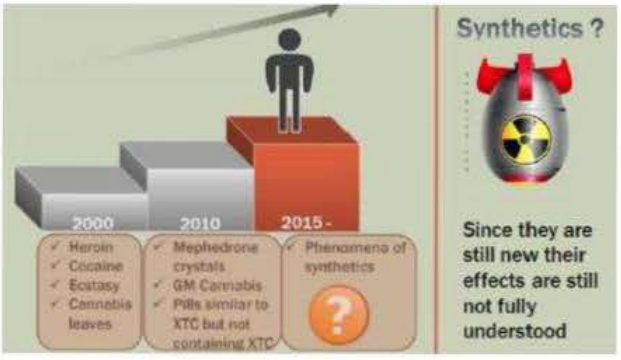

Figure 1 - The trend of illicit drug misuse as seen from the Laboratory. GM - Genetically Modified.

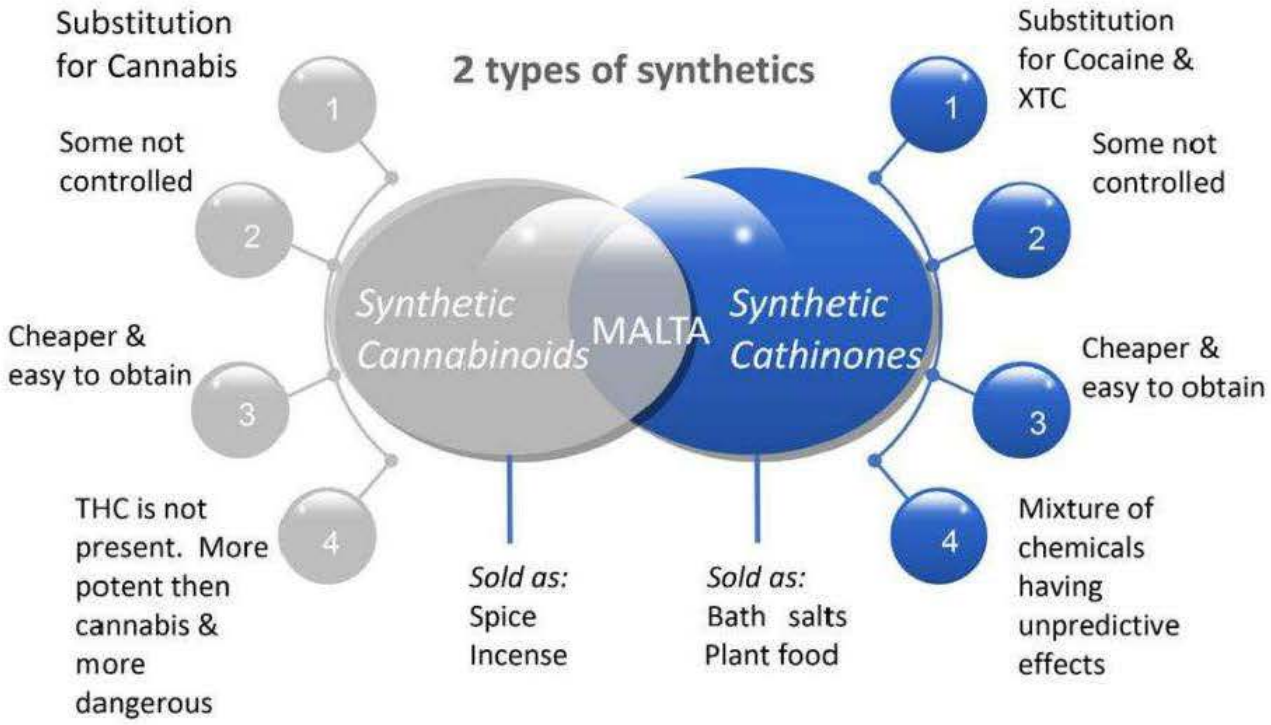

Figure 2 - The current situation on the Maltese Islands.

Synthetic cannabinoids appear as green herbal material (Figure 3). The green herbal material is made up of dried plant material and chopped up herbs in a mixture of colours including beige, red and brown. The active ingredients are synthetic chemicals (the cannabinoids) that are then sprayed onto the plant material. Like cannabis, synthetic cannabinoids are typically smoked.

On the contrary, synthetic cathinones usually appear as white or brown crystal-like powder (Figure 3). Like the drugs they mimic, synthetic cathinones are typically snorted, smoked or injected. Both synthetic cannabinoids and synthetic cathinones can kill.

Another group of NPSs whose appearance to date has been limited on the Maltese Islands are the ***Synthetic Opioids***. These mimic the effects of heroin and are usually added to heroin. Synthetic opioids include the fentanyls which is the most well-known group (Figure 4). Although this class has an important and well-documented

Figure 3 - A typical sample of a synthetic cannabinoid (left) and a sample of synthetic cathinone (right). Photos courtesy of the Department of Chemistry, Faculty of Science, University of Malta.

therapeutic role - it has analgesic and sedative effects and is used in the management of severe pain and in anaesthesia - misuse can lead to life-threatening adverse effects and acute toxicity. The fentanyls are 50 times more potent then heroin while carfentanyl (licensed for veterinary use on large animals) is 5,000 times more potent then heroin. As one can imagine heroin laced with such compounds would have severe consequences on the user and death can easily result from such ingestion.

3. WHY ARE THEY SO DANGEROUS?

First of all, when dealing with NPSs, one must keep in mind that these are (1) man-made chemicals and (2) their effects on the human body are still not completely understood.

Synthetic cannabinoids are generally much more harmful than plant-based cannabis. Adverse reactions to synthetic cannabinoids have been reported including deaths whereas adverse reactions to natural cannabis are usually not lethal.

Synthetic cathinones are psychostimulants whose risks are similar to those of cocaine and ecstasy but are much more toxic. The media has often reported instances of bizarre behaviour by someone who has taken synthetic cathinones. This is a rare and uncommon side-effect known as *excited delirium*.

Another reason these new NPSs are dangerous is because the user never knows what he is taking. Unless tested, today you never know whether brown powder is laced with fentanyl or white powder is purely a synthetic,

Figure 4 - The potency of the 'traditional' drug heroin compared to the NPSs Fentanyl and Carfentanyl.

and neither do you know whether the green herbal grass has been sprayed with a synthetic cannabinoid which can be lethal.

One very common question that is asked is "if they are so dangerous, why do people still take them?" Well simply put, the reasons include:

- They are readily available
- They are cheaper than 'traditional' drugs
- People may use NPSs since they can more easily avoid detection - at the moment frontline tests do not detect most of the new synthetics, and
- People may just take NPSs accidentally thinking they are taking some other drug instead.

4.WHAT TO LOOK OUT FOR?

Since synthetic cathinones and synthetic cannabinoids are usually purchased over the internet, as healthcare professionals one should be on the look-out for any strange activity reported by patients at home. In keeping with this one should also be aware of common street names of synthetic cathinones, including *Ivory Wave, Vanilla Sky, Cloud 9, White Lighting* and *meow-meow*. These packets usually arrive through the post from China (unless they are stopped by Customs) and sold in the form of 200mg and 500mg packets (Figure 3). The packets often contain a note declaring that the contents are "not for human consumption". This is included in the label with a view to circumvent criminal proceedings against the distributor in specific countries.

Synthetic cannabinoids also come from China in packets usually sold as *Spice* or *Incense*. The packets may also contain a sweet odour since a fragrance such as vanilla, blueberry or strawberry is also added to the green grass.

5. HANDLING

Taking drugs has always been dangerous; however with the introduction of the new synthetics, the user is playing a dangerous game of Russian roulette. Whereas before only one bullet was loaded in the chamber, these days you have 2 bullets loaded in the same chamber. The new synthetics have complicated both the symptoms and the treatment. Prevention and Education are the best antidote.

Whether a police officer, a nurse or a doctor, as a first responder all should take great care when handling unknown powders. Several European Agencies have issued out educational pamphlets directed to first responders, most notably on fentanyl. A similar pamphlet was also issued out by the Forensic Drug Analysis Laboratory located at the Department of Chemistry, University of Malta, to increase the awareness of Fentanyl before it reaches our shore (Figure 5).

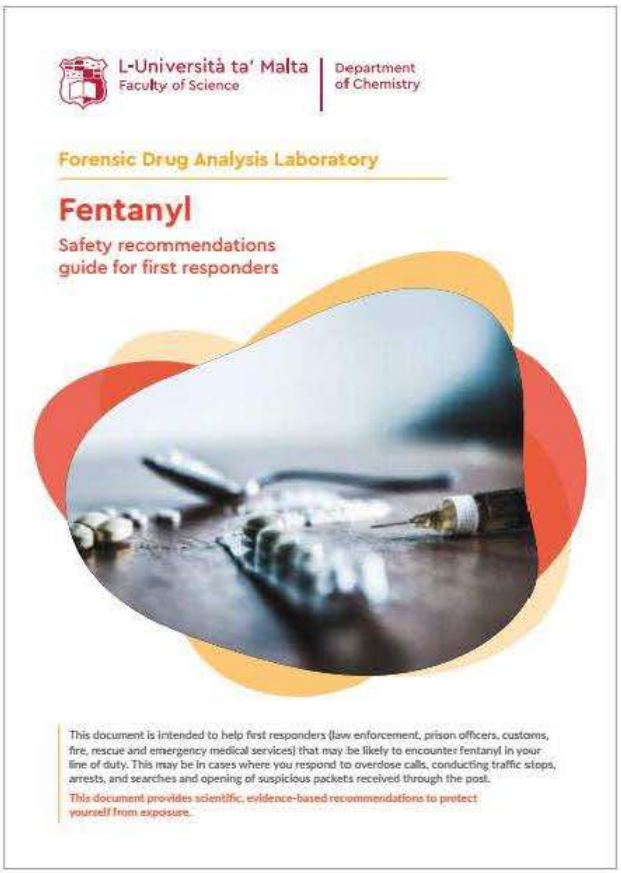

Figure 5 - The front page of the pamphlet, Fentanyl – Safety recommendations guide for first responders.