

PSYC1022: The Psychology of Addiction

Topic 1: Origins & Manufacture of addictive drugs (III)

Dr. Helena Pacitti

Outline

- Others:
 - MDMA
 - Cannabis



1

MDMA

- 3,4-methylenedioxy-N-methylamphetamine
 - often classed within the 'amphetamine' group
 - greater empathogenic effect than other stimulants
 - Also a Hallucinogen
 - Different experiences across individuals (hence "Other" classification)
- Primary precursor is Safrole, a light oily liquid extracted from the root-bark or the fruit of the sassafras tree.
 - numerous methods for synthesising safrole into MDMA.
- 1912: first synthesized by the German chemist, Anton Köllisch.
 - Employed by Merck to develop a haemostatic drug to stop abnormal bleeding (Bernschneider-Reif et. al., 2006)

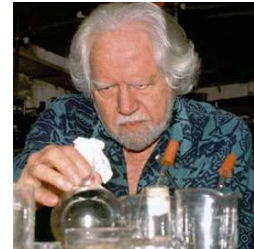


Anton Köllisch

2

MDMA

- 1927: Merck scientist, Max Oberlin, reports MDMA's similarity to ephedrine.
- 1953: US military commissions studies with a range of psychoactive compounds including MDMA.
- 1958: independent synthesis of the same compound in Japan by Yutaka Kasuya.
- 1970: First report of recreational MDMA use in the US.
- 1970s: Pharmacist, Alexander Shulgin, synthesizes MDMA & publishes reports of its mood enhancing effects & improvement of therapeutic engagement.
- 1980s: MDMA becomes increasingly popular in dance/rave culture.
- 1985s: State prohibition of the compound is introduced.
- 2010s: MDMA usage decreasing due to scarcity of precursor chemical
 - academic documents to side-step prohibitive laws against of existing drugs.



Alexander Shulgin

3

Cannabis

- Believed to have originated in the mountainous regions northwest of the Himalayas.
- Two varieties:
 - Sativa: greater fibre content useful for making woven materials
 - high psychotomimetic effect
 - Indica: lower fibre content
 - low psychotomimetic effect
 - It is thought these two varieties were separated from the wild type through selective breeding
- Native populations made use of the plants for intoxication, clothes, nets, rope and string



Small & Cronquist (1976)

4

Cannabis

- 1000 BC: evidence for the earliest cannabis consumption
 - burial site in Turpan, North-West China.
 - The 'shaman' had 789g of cannabis on his person.
 - Site is especially important because it is the earliest recorded site in which researchers were able to conclusively demonstrate the presence of THC Russo et al. (2008)



5

Cannabis

- Earlier texts refer to the medicinal/intoxicant/spiritual effects of cannabis.
 - 2700 BC: Chinese herbal medicine the Pên-ts'ao Ching
 - 2000 BC: religious/philosophical text the Hindu Vedas.
 - Later references to cannabis in Japanese, West Asian, Middle Eastern, North African, Roman & Germanic texts
 - chart the spread of cannabis use across the ancient world following the trade routes of the steppe highway/silk road



Chinese Pên-ts'ao Ching

6

Cannabis

- Contemporary cultivation of cannabis is global (UNODC, 2014)

Cannabis cultivation, production and eradication, 2012									
Country	Cultivated (ha)	Eradicated (ha)	Harvestable (ha)	Production (tons)		Plants eradicated		Sites eradicated	
				Indoor	Outdoors	Indoors	Outdoors	Indoors	Outdoors
Afghanistan	10,000				1,400				
Albania					50		33,000		154
Australia						17,668	35,146	322	240
Azerbaijan	6	6	0	308			7,538		121
Bosnia and Herzegovina							2,807		3
Brazil		22		185			616,133		5
Bulgaria						6,913		42	
Chile						18,526	216,902	1,377	291
Costa Rica	8	8	0				965,320		129
Italy						7,706	4,114,911	458	1,318
Latvia						3,796	101	4	3
Lebanon	3,500	800	2,700						
Mexico		9,058			12,166				
Morocco	52,000	5,000	47,000	760	38,000				
New Zealand						21,202	119,059	783	
Philippines		21					1,224,738		188
Poland		4					58,156	687	627
Tajikistan							2,180,121		
Ukraine	529						2,200,000		
United States of America						302,377	3,631,582	2,596	6,470

7

Cannabis

- Cannabinoids are the main psychoactive component within the cannabis leaf.
- Phytocannabinoids: found in plants
- Synthetic cannabinoids: man made from other compounds.
- Around 85 phytocannabinoids have been isolated from the cannabis plant
 - most research has focused on Δ 9-tetrahydrocannabinol (THC) & cannabidiol (CBD).
- THC: primary psychoactive intoxicant, as indicated by the level of THC dose being associated with the subjectively reported drug effect (Miller et al. Pharmacol Biochem Behav 9, 573)
- The supposed potency of different forms of the drug have different THC concentrations:
 - Cannabis herb (leaves) 5%
 - Flowers (buds) 12%
 - Resin (Hashish) 20%
 - Oils (Hash oil) 60% (UNODC, 2009)
- There is initial evidence that although CBD has little psychoactive effect it may reduce the psychotomimetic effect of THC (Joy et al. 1999)



8

Cannabis as a therapeutic

(Grotenhermen et al. 2012)

TABLE			
Overview of controlled trials of cannabis medications for established indications* ¹			
Indication	Number of randomized controlled trials (some three-armed)	Positive studies	Negative studies
Spasticity	n = 12 (dronabinol: [e1, e2, e4–e6]; cannabis: [e1–e3, e6–e12]) in multiple sclerosis	n = 9 (e4–e12)	n = 3 (e1–e3)
	n = 3 (dronabinol: [e13–e14]; nabilone: [e15] in paraplegia)	n = 3 (e13–e15)	–
Nausea and vomiting due to cytostatics	n = 41 (dronabinol: [e16–e34]; cannabis cigarettes: [e25]; cannabis extract: [e35]; nabilone: [e36–e52]; levonantradol: [e53–e56])	n = 40	n = 1 (e18)
Loss of appetite/weight loss in HIV/Aids	n = 7 (dronabinol: [e59–e65]; cannabis cigarettes: [e63–e65])	n = 7	–
	n = 4 (dronabinol: [e66–e68]; cannabis extract: [e69]) in various tumor diseases	n = 3	n = 1 (e69)
	n = 1 (dronabinol: [e70]) in Alzheimer's disease	n = 1	–
Chronic pain	n = 14 (dronabinol: [e71–e74]; nabilone: [e75, e76]; cannabis extract: [e73, e74, e77–e79]; cannabis cigarettes: [e80–e83]; CT3 (ajulemic acid): [e84]) in neuropathic pain or pain in MS	n = 12 (e71, e73–e75, e77–e84)	n = 2 (e72, e76)
	n = 12 (dronabinol: [e85–e87, e93]; NIB: [e88]; benzopyrrolidine: [e89]; cannabis extract: [e87, e90, e94]; nabilone: [e91, e92, e96]; cannabis cigarettes: [e95]) in chronic pain (cancer, rheumatism, fibromyalgia)	n = 11 ([e85, e86, e87] cannabis extract, [e88, e90–e96])	n = 2 ([e87] dronabinol, [e89])

*¹ A complete list of clinical trials of cannabis medications can be found on the website of the IACM (24)

Medicinal Cannabis

- Still a prohibited substance in Australia although differences in state laws exist
 - [Drug laws in Australia](#)
 - [NSW Drug misuse and trafficking Act](#)
- But, can be legally used as a therapeutic in some cases and grown for medical/research use
 - [TGA Special Access Scheme](#)
 - [Medical cannabis cultivation](#)
- Efficacy for treating:
 - Pain
 - Muscle spasticity
 - Pediatric epilepsy
 - Nausea/vomiting
 - Appetite stimulant
- Research is ongoing...



Synthetic Cannabis

- John William Huffman, organic chemist
 - synthesised a whole series (JWH-018)
 - funded by the National Institute on Drug Abuse (NIDA)
- Prof. Raphael Mechoulam, Hebrew University
 - developed HU-210
- Pfizer developed CP 47,497
- These synthetic cannabinoids are considered designer drugs
 - mixed herbs infused with synthetic cannabinoids.



11

Topic Summary

- Knowledge of historical origins of various depressant, stimulant and other drugs.
- Understanding of drug discovery process, natural vs. synthetic compounds and manufacture.
- Recreational use and abuse aside, drugs have a wide range of therapeutic applications.
- Substance use is embedded in human culture and has been since antiquity.



12