

A RETROSPECTIVE ANALYSIS OF DATA FROM CANNABINOID FORENSIC CASES IN THE CENTRE OF PORTUGAL BETWEEN 2020 AND 2023

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INTRODUCTION

Marijuana, hashish and other psychoactive products obtained from Cannabis are the most produced and trafficked illicit drugs around the world. The behavioral and physiological cannabinoids (CAN) effects have been increasingly reported over the recent decades, including euphoria and relaxation feelings, time reaction changes, lack of concentration, learning and memory changing or mood states (such as panic reactions and paranoia).

MATERIAL AND METHODS

The authors studied all the positive cases for cannabinoids in the Centre of Portugal, from autopsies of road traffic and work accidents and of suicides performed at the Pathology Service of Coimbra's Delegation and other cabinets of the National Institute of Legal Medicine and Forensic Sciences (NILMFS), and from living cases of road traffic surveillance from June 2020 until March 2023. Samples were tested for the presence of CAN by ELISA and confirmed by LC-MS/MS.

RESULTS AND DISCUSSION

The cases were received at the Forensic Toxicology Laboratory, according to the distribution presented in Figure 1. During the studied period, a total of 4599 toxicological requests for cannabinoids were received. 461 cases (10.0%) tested positive in screening tests, all confirmed by LC-MS/MS. Among the positive cases, 77.0% were road traffic surveillance cases, and 24.9% related to other *antemortem* and *postmortem* cases. We observed that there was an accentuated consumption of cannabinoids in individuals between 21 and 30 years-old, with an average of 33 years-old (Fig. 2), and a higher prevalence in men (92.4%).

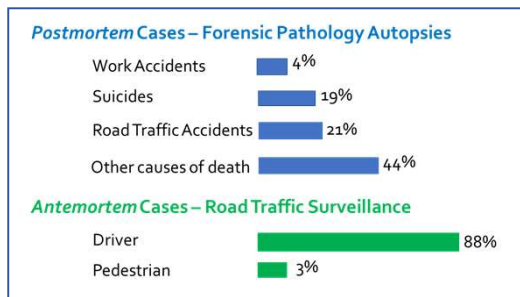


Fig. 1 – Distribution of the analysed cases.

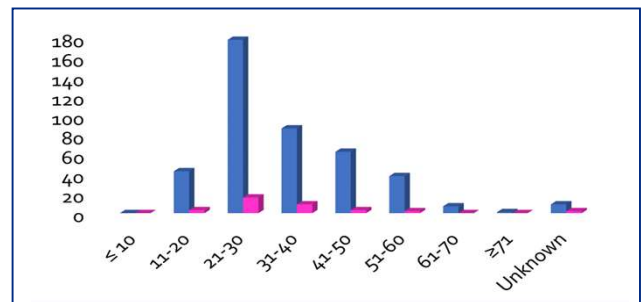


Fig. 2 – Age distribution of the positive CAN results.

THC was confirmed and quantified in 76.5% of the cases, with an average blood concentration of 7.6 ng/mL. The active metabolite, 11-OH-THC, was present in 44.5% of the cases with a mean concentration of 3.6 ng/mL; The mean concentration achieved for THCCOOH was 15.1 ng/mL in 56.2% of the positive cases. It is important to highlight that in the 75.1% positive road traffic surveillance cases, THC was detected with a mean concentration of 6.6 ng/mL and in postmortem cases related to road traffic accidents this value increased to 10.4 ng/mL (Fig. 3).

25.4% of the cases (n=117) had cannabinoids together with other psychoactive substances (Fig. 4) and ethanol was present in 162 of the cases, with 33.9% presenting a $0.5 \leq \text{BAC} < 1.2$ g/L and 50.6% a $\text{BAC} \geq 1.2$ g/L (Fig. 5). 21% of the Forensic Pathology and Clinic cases were road accidents with 79.2% being drivers.

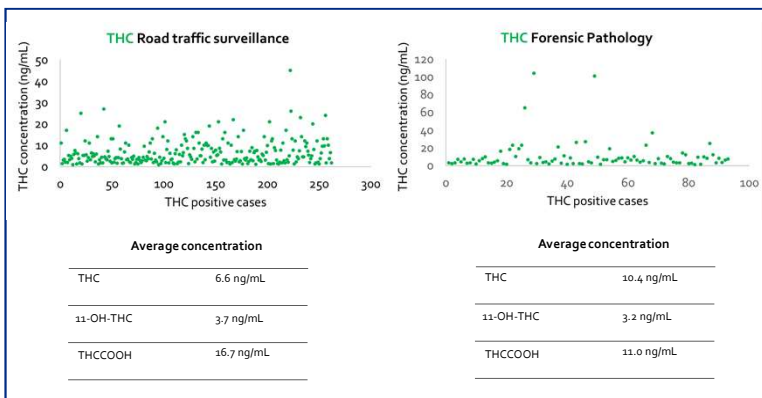


Fig. 3 – Average concentration of CAN in Forensic Pathology and Road Traffic surveillance analysis.

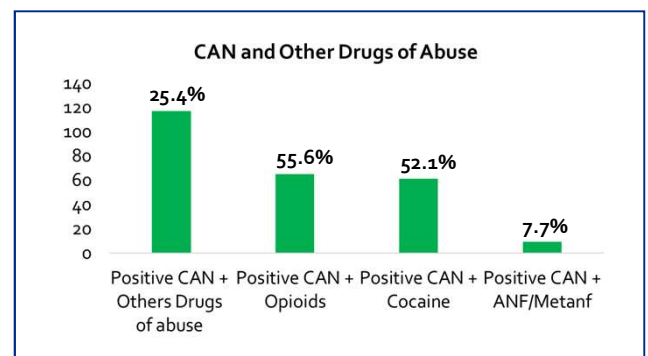


Fig. 4 Positive cases for cannabinoids and other drugs of abuse.

CONCLUSION

It is clear that cannabis is frequently used before and during driving, with high levels of the active compounds being detected, demonstrating the impairment, being driving risk effects increased with the dose, being more extensive and persistent in activities that require more careful attention. It is also important to be aware of the results with simultaneous use of THC and alcohol, alerting for the increased accident risk.

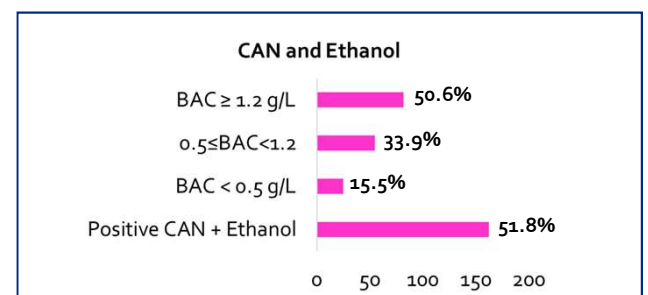


Fig. 5 - Positive cases for cannabinoids and ethanol.