

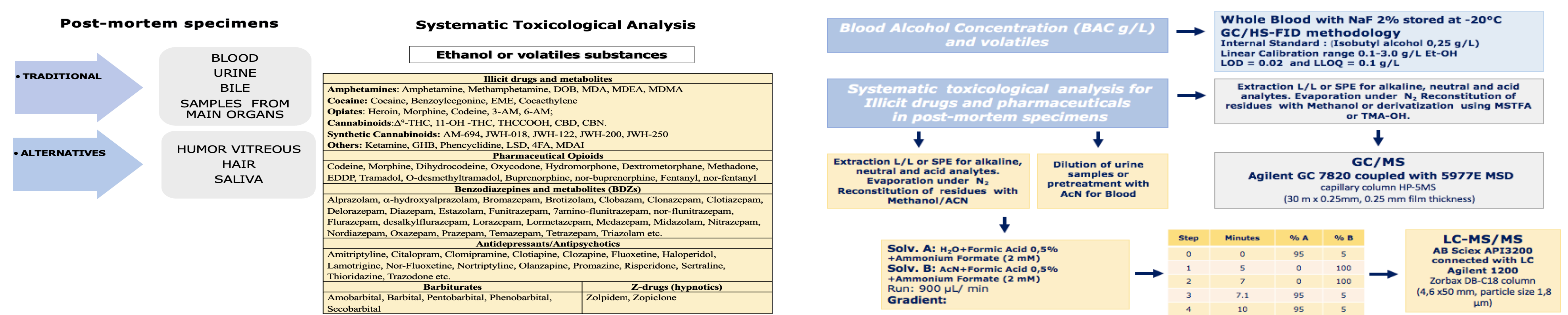


Introduction

Road safety is a priority objective to improve healthy but also to reduce the high social costs associated with the injuries and disabilities resulting from road traffic crashes. The neuro-psychic, cognitive and behavioral alterations resulting from the intake of alcohol and/or illicit/licit substances are fully described in the literature. These substances greatly contribute to causing drive impairment, with a consequent increase in the risk of accident, sometimes fatal. Mortality, directly or indirectly related to drug abuse represents one of the main causes of death in many European countries. Aim of this study is to investigate the prevalence of alcohol and licit/illicit drugs consumption among drivers using data collected from the post-mortem toxicological analysis performed on biological sample of road victims in the area of Campania district (Southern Italy) over the past 10 years (2013- 2022).

Materials and Methods

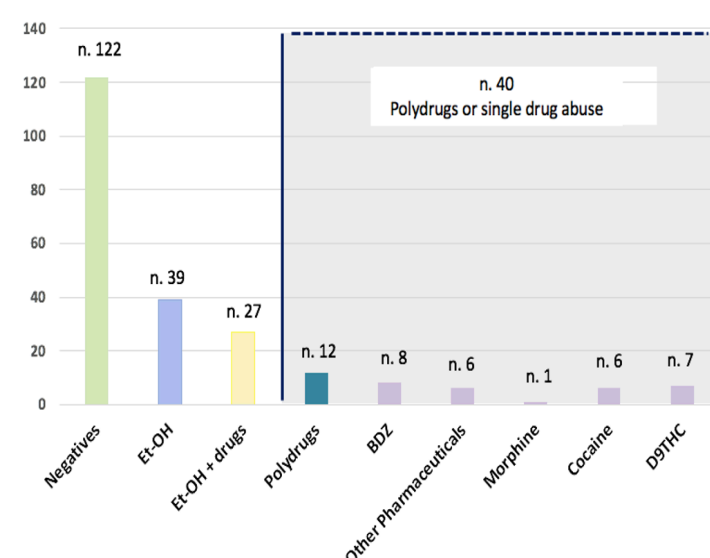
Data relating to post-mortem toxicological analysis requested by the Public Prosecutors of Naples and Santa Maria Capua Vetere and carried out by Forensic Toxicology Laboratory of University of Campania "Luigi Vanvitelli" were analyzed in all cases of road accidents involving both drivers, passengers and pedestrians. GC/HS-FID were used to test blood alcohol concentration (BAC) and systematic toxicological analysis were performed on post-mortem specimens by GC/MS or LC-MS/MS in order to detect licit (benzodiazepines, antidepressants/antipsychotics, hypnotic) and illicit drugs (amphetamines and analogues, cocaine, opiates, methadone, buprenorphine, cannabis and NPS).



Results

Between 2013 and 2022, 228 fatal road accidents occurred in these districts. 106 cases (46,5%) tested positive for alcohol and/or drugs; among them, 104 male (98,1%) and 2 female subjects (1,9%) were counted. The 40- 49 age group was the most involved category (28,3%). Among the 106 positive subjects, 36,8% tested positive only for alcohol, 37,7% had taken licit or illicit drugs, individually or in combination, while 25,5% of the all subjects tested positive for alcohol and drugs in combination. 21 subjects (19,8% of the all positive subjects) had taken polydrugs, 42,8% of them in combination with alcohol. Of all drugs detected, Cocaine (58,2%) and THC (32,8%) had the highest prevalence, followed by benzodiazepines (19,4%) and pharmaceuticals (14,9%). Among the 40 subjects tested positive only for drugs, benzodiazepines were the majority (20%), followed by THC (17,5%), cocaine (15%) and other pharmaceuticals (15%). Cocaine plus THC was the most frequent combination in polydrugs users, with (28,6%) or without (9,5%) alcohol. Regarding subjects tested positive only for alcohol, 71,8% had a blood alcohol concentration greater than 1,5 g/L, whereas among subjects who had taken both alcohol and drugs in combination, the majority (46,1%) had a BAC between 0,8 g/L and 1,5 g/L or BAC > 1,5 g/L.

Results of toxicological analysis in traffic-related deaths



Toxicological results of polydrugs users with and without alcohol in combination

Et-OH + drugs (27)	Single drug (18)	Poly-drugs (9)
	Cocaine (10) Δ9THC (5) BDZ (1) Morphine (1) Methadone (1)	Cocaine + Δ9THC (6) Cocaine + BDZ (1) Cocaine + Methadone + BDZ (1) Methadone + Morphine + BDZ (1)
Poly-drugs (12)		
	Cocaine + Δ9THC	2
	Cocaine + Morphine	2
	Pharmaceuticals (BDZ + other medicinal drug)	2
	Δ9THC + Methadone	1
	Morphine + Pharmaceuticals	1
	Cocaine + Pharmaceuticals	1
	Cocaine + Δ9THC + BDZ	1
	Pharmaceuticals (opioids + SNRI + BDZ)	1
	Morphine + Methadone + Pharmaceuticals	1

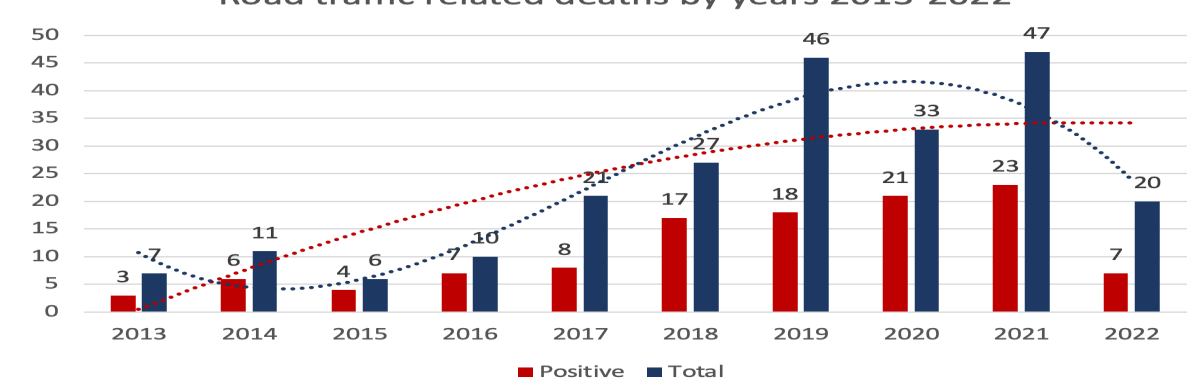
Distribution of the BAC levels among subjects tested positive for Et-OH

BAC range	Pos. only for Et-OH		Pos. only for drugs		Pos. for Et-OH and drugs	
	N°	%	N°	%	N°	%
< 0,5 g/L	1	2,60	-	-	1	3,90
0,5 - 0,8 g/L	1	2,60	-	-	1	3,90
0,8 - 1,5 g/L	9	23	-	-	12	46,10
> 1,5 g/L	28	71,80	-	-	12	46,10
Tot.	39	100,00	40	-	26	100,00

Discussion and Conclusion

Over the years, there has not been a decrease in number of deaths due to road traffic accidents involving subjects tested positive for alcohol and/or drugs, despite the Italian Law 41/2016 came into effect on 23rd of March 2016 and criminalized vehicular homicide and traffic related injuries. The association between alcohol and drugs is a phenomenon of considerable social and health importance, which involves subjects belonging to all age groups, drug addicts and/or occasional consumers. Our results showed a prevalence of high BAC in most of the cases, with levels largely above 1,5 g/L. Cocaine and THC are still the most common illicit drugs involved in road traffic-related deaths.

Road traffic related deaths by years 2013-2022



Bibliography

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- 2) Normativa- il portale della Legge vigente "Legge 23 marzo 2016, n. 41"