

Toxicological Aspects of Fatal Accidents in Southwestern Greece: A Three-Year Experience (2001-2003)

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S u m m a r y. Purpose of the present study was to evaluate the toxicological aspects of fatal accidents in Southwestern Greece (Peloponnesus, Ionian Islands and Epirus) during the last three years. Data were collected from the case files of the Laboratory of Toxicology and Pharmacokinetics of the General Hospital of Patras *Agios Andreas*. A total of 322 cases were collected and were subdivided into 238 traffic and 84 non-traffic related cases. Cases were then analyzed as to age, sex and cause of death. Traffic-related fatal accidents were classified into cases due to drug abuse: Mostly alcohol followed by opiates, cannabinols, benzodiazepines, amphetamines, cocaine and tricyclic antidepressants. Almost all the cases referred to car drivers except 2 cases that concerned pedestrians. The majority of the non-traffic related fatal accidents involved drownings, occupational accidents, electrocutions and deaths due to fire accidents. In the majority of the latter cases (especially occupational accidents and drownings), victims had taken alcohol.

INTRODUCTION

Over the years, medicine has made important achievements leading to a significant extension of the mean lifetime of people. However, traffic accidents still remain a burden for today's society and they are considered a factor that contributes to the upheaval of mortality and morbidity in almost every country all over the world (1). Traffic accidents are one of the most common causes of death and disability in all ages among the population of every country, especially in developed countries. They are the most common cause of death among young people between 5 and 32

years of age and the third most common cause of death among all ages. In the USA, 45,000 Americans lose their lives every year and 2,000,000 are getting injured in traffic accidents. In Europe, approximately 50,000 deaths and 1,500,000 casualties are registered every year. In Greece, traffic accidents have reached a significant percentage among all cases of sudden deaths: Almost 2,000 dead and 30,000 casualties are the victims of traffic accidents every year (2).

Fatal non-traffic related accidents involve mostly drownings and occupational accidents. Drownings occur usually at sea, especially in the summer months. Alcohol, drugs and carelessness are the most important factors leading to this kind of fatal accidents (3).

METHODS

The cases were selected from different sources, such as hospital clinics, morgues of the local hospitals, police, and port and traffic police stations throughout Southwestern Greece. Samples had been transferred to the Laboratory of Toxicology and Pharmacokinetics of the General Hospital of Patras *Agios Andreas* for toxicological analysis. The samples were mainly blood, urine and postmortem tissue (liver, kidneys, lungs, brain). In some cases, vomitus, gastric and bile fluid had been sent.

Analysis consisted of extraction procedures and a variety of techniques: Qualitative analysis of cannabinols employed thin-layer chromatography (TLC), while quantitative analysis of alcohol blood content employed gas chromatography (GC). The

Fluoro-Polarization Immune Assay was used for the quantitative analysis of benzodiazepines, barbiturates, cocaine, amphetamines, opiates, tetrahydrocannabinols, tricyclic antidepressants and CO (4).

RESULTS

A total of 322 fatal accidents were investigated during 2001-2003. Traffic accidents involved 238 cases and non-traffic accidents were 84. In the total of traffic accidents, 208 (87.4%) referred to men whereas only 30 (12.6%) referred to women. In 41.7% (98 cases) of the fatal traffic accidents, men younger than 36 years were responsible. Men between 36 and 50 years of age caused 42 accidents (17.6%) and men older than 50 years caused 62 accidents (26.1%). Middle-aged and elderly women (aged between 46 and 75) were responsible for 55% of the fatal traffic accidents caused by women and for 6.3% of the total amount of fatal traffic accidents. Young women (aged between 18 and 45) were responsible for 45% of the fatal traffic accidents caused by women and only for 5.5% of the total number of fatal traffic accidents.

Alcohol assays were negative in 32 cases (13.4%). Alcohol blood levels from 0.10 to 0.50g/l had been found in 91 cases (38.2%), whereas alcohol blood levels over 0.50g/l had been detected in 93 cases (39.1%). In all the above cases, victims had taken only alcohol and no other psychoactive substances had been found in their blood, urine or postmortem tissue. There were 15 cases (6.3%) where victims had taken alcohol in combination with other psychoactive substances, mostly cannabinols but also cocaine, opiates, benzodiazepines and tricyclic antidepressants. In only 2 of these cases high blood alcohol levels were identified (over 0.50g/l). There were also 4 cases (1.7%) where victims had taken a combination of psychoactive substances (cannabinols, benzodiazepines and amphetamines in 2 cases and barbiturates, opiates and tricyclic antidepressants in the other 2 cases), without alcohol. In one case, only opiates had been taken. There was no woman among the victims that had used a combination of various substances.

In a total of 84 non-traffic accidents, 52 cases (61.9%) were drownings, 8 cases (10.7%) were occupational fatal accidents, 7 (8.3%) were deaths due to fire accidents, 5 (6%) were deaths caused by electrocution, 3 (3.6%) were fatal accidents due to explosions, 3 (3.6%) were fatal

accidents due to falls, 2 (2.4%) were deaths due to obstruction of the respiratory tract by food particles, 2 (2.4%) were deaths caused by suffocation and finally 1 case (1.2%) was a lightning strike.

In 23 cases (27.4%) of the non-traffic accidents, alcohol assays were negative. These assays were also negative to any other substance. In 58 cases (69%), alcohol assays were positive and finally in 2 cases (2.4%) combinations of alcohol with other psychoactive substances (opiates, cannabinols and tricyclic antidepressants) had been detected. There was only 1 case (1.2%) where the victim had taken detectable levels of tricyclic antidepressants.

CONCLUSIONS

The most common cause of fatal accidents during 2001-2003 was impaired driving due to alcohol consumption. The second most frequent cause of fatal accidents was drownings, which happened mostly at sea and in the majority of these cases victims had also taken alcohol. Therefore, alcohol consumption represents a significant risk factor for fatal accidents and especially for fatal traffic accidents. In comparison to alcohol, drug abuse involving soft drugs, sedatives and other medical products was less often implicated, in agreement with observations in other areas of Greece (5).

Fatal traffic accidents are most common among men compared with women in Southwestern Greece, which is in agreement with the general amount of traffic accidents in Greece caused by men, which reaches 93% of the total (2).

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