
MEDICOLEGAL PATTERN OF TOXIC DEATHS IN CAIRO AND GIZA GOVERNORATES: RETROSPECTIVE STATISTICAL STUDY (2009-2013)

Marcelle R. Haroun, Mohamed K. Ahmed, Ahmed H. Rezk, Eslam S. Metwally and Eman S. Ez Elregal

Forensic medicine and Clinical Toxicology Department, Faculty of Medicine, Benha University, Egypt

ABSTRACT

Background: Acute poisoning is an important cause of unnatural death which may occur under a range of different epidemiological, social, cultural and religious implications. **Aim:** Study the medicolegal pattern of the reported cases of death due to poisoning in the region of Cairo and Giza governorates from 2009 to 2013. **Method:** Retrospective analysis of reports of all the cases of suspected fatal poisoning received by Zeinhom Morgue. **Results:** Toxic deaths represented 2.5% of all deaths registered in Zeinhom Morgue. Males, accidental manner, oral route were predominant. The most common toxin was carbon monoxide. **Conclusion and recommendation:** The pattern of toxic deaths in Cairo and Giza governorates varies in both epidemiological and medicolegal aspects, the possibility of under-referral and reporting of these cases to Zeinhom Morgue must be taken into account. Competent system of referral of suspected toxic deaths for medicolegal investigation and autopsy must be established.

Key words: Toxic deaths, Cairo & Giza governorates, Medicolegal pattern.

INTRODUCTION

Acute poisoning is an important cause of unnatural death which may occur under a range of different epidemiological, social, cultural and religious implications. The substance involved may be household products, toxic gases, one of controlled substances, prescription medicines, over-the-counter (OTC) medicines, or even complex mixtures such as traditional remedies. In order to understand epidemiological characteristics of acute poisoning mortality, some knowledge of how such deaths are investigated, certified, registered, and coded is needed (**Sut & Memis 2008 and Lam et al., 2010**).

Worldwide poisoning is one of the important causes of mortality and morbidity. Death as a reason of poisoning/drug abuse is of enormous

medical, legal and social significance (**Eddleston & Phillips, 2004**).

All over the world there were an estimated 907,000 emergency department (ED) visits related to poisoning in 2005, accounting for approximately 0.79 % of all ED visits (**Pitts et al., 2008**).

An important source for information on the extent and effects of poisoning exposures is the American Association of Poison Control Centers (AAPCC). The AAPCC reports approximately 1.5 million potentially toxic exposures all over the world per year, about 56% of these exposures are due to xenobiotics that are commonly found in or around the house, such as cleaning products, cosmetics, art and craft products, plants, hydrocarbons and insecticides, whereas approximately 44% are to

pharmaceutical agents (**Illinois Poison Center, 2015**).

A review of a toxicology case registry noted that sedatives, analgesics and antidepressants accounting for the most frequently mentioned exposures (**Wiegand et al., 2012**).

There is a particular problem in the developing world, where highly toxic pesticides are readily available and are used in the suicides of hundreds of thousands of people every year (**Gunnell et al., 2007**).

The most important problem in Egypt is that there is no data bank for intoxicated cases. According to the annual report of the Poisoning Control Center of Ain Shams University which is the first and largest national poison treatment centre of Egypt, the recorded mortality rate was considered comparatively low 0.3%, according to the total number of toxic deaths in the same center on 2005 (**Gamaluddin et al., 2006**).

A substantial decrease of the total annual number of intoxications was evident on 2011. A significant decrease of organophosphate intoxications from 17 % on 2005 to 9.8% on 2011 reflected the efforts triggered by Poisoning Control Centers, Media and Ministry Of Health to restrict the widespread use of these chemicals. On the other hand a significant rise of drug overdose was noted mainly due to the progressive dissemination of tramadol. Another impressing finding is the decrease of methanol poisoning mortality rate by about 75% due to the tight control against alcoholic beverages adulteration (**Masry & Tawfik, 2013**).

A recent study was made in Egypt in some governorates to detect the most common causes of suicide and it

revealed that suicides in Minofiya, Gharbiya and Kafr El-shekh governorates were by ingestion of insecticides (70.8%) which was the most common suicidal method used among the studied cases (**Hassan et al., 2015**).

Concerning food poisoning in Egypt, a study was made in the Poisoning Control Center of Ain Shams University; found that food poisoning is a common health problem in Egypt. Major age group affected was young-adult followed by school children. In particular, unspecified food poisoning followed by OP insecticides contaminated food was the most common causes of food poisoning. Botulism and OP insecticides were the most lethal toxicity (**Abd-Elhaleem & Abd-Elkarim, 2011**).

AIM OF THE WORK

The aim of this work is to study the medicolegal pattern of the reported cases of death due to poisoning in the region of Cairo and Giza governorates from 2009 to 2013.

MATERIAL & METHODS

The present study is a retrospective analysis of reports of all the cases of suspected fatal poisoning received by **Zeinhom Morgue** during the period from January 2009 to December 2013. Data of poisoning cases had been collected from inquest reports, hospital reports, autopsy reports and reports of chemical analysis of viscera and body fluids.

These collected data had been subjected to both epidemiological and medicolegal analysis.

I Epidemiological analysis: age, gender, residence, season, marital status, occupation.

II Medicolegal analysis: toxic agent(s) used, route of administration, manner of death, scene of death, clinical presentation, medical intervention if any.

III Statistical analysis:

The clinical data were recorded on a report form. These data were tabulated and analyzed using the computer program SPSS (Statistical package for social science) version 16.

Descriptive statistics were calculated for the data in the form of frequency and distribution for qualitative data.

RESULTS

The present study showed that the total number of cases died by toxic substance was (190) cases out of

(7505) cases presented to Zeinoh Morgue recorded during the period of study (from January 2009 to December 2013), with a percentage of (2.5%).

The distribution of the studied toxic deaths through the period of the study was 32 cases in both 2009&2010, 49 cases in 2011, 47 cases in 2012 and 30 cases in 2013.

The age of the studied cases ranged between (1-90) years with mean age of (28.44 ± 15.29) . Most of the studied cases were males (60%).

The majority of studied cases lived in rural areas (83.7%). There is no significant seasonal variation in distribution of toxic deaths between summer and winter; however a small proportion of cases occurred in spring and in autumn.

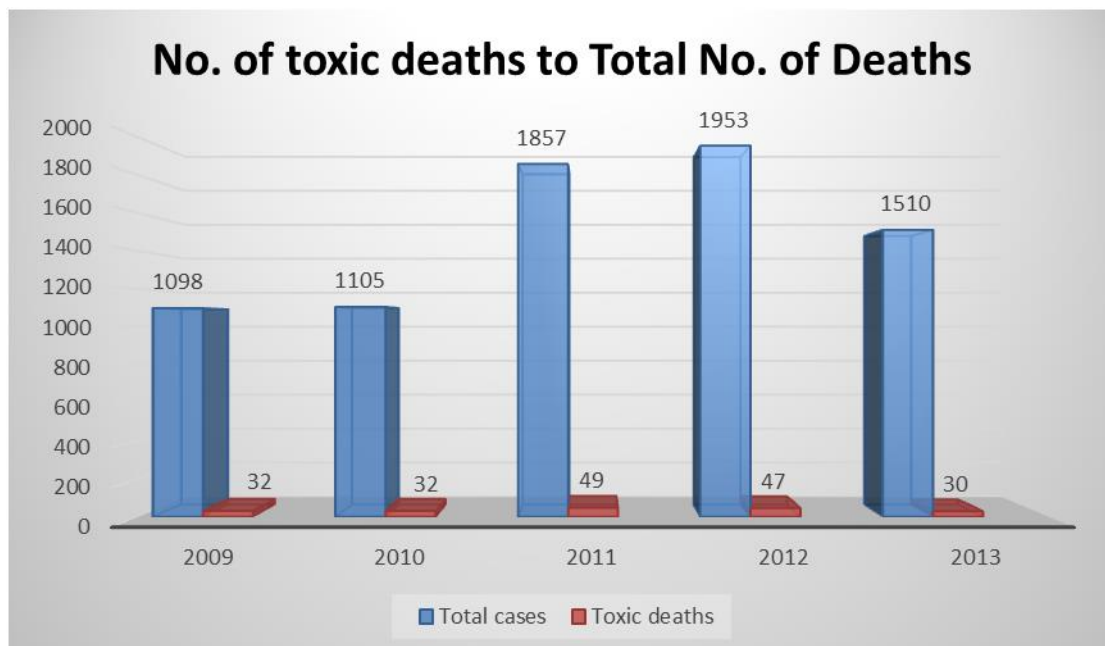


Figure (1): The number of toxic deaths in relation to the whole number of cases registered in Zeinoh Morgue per year.

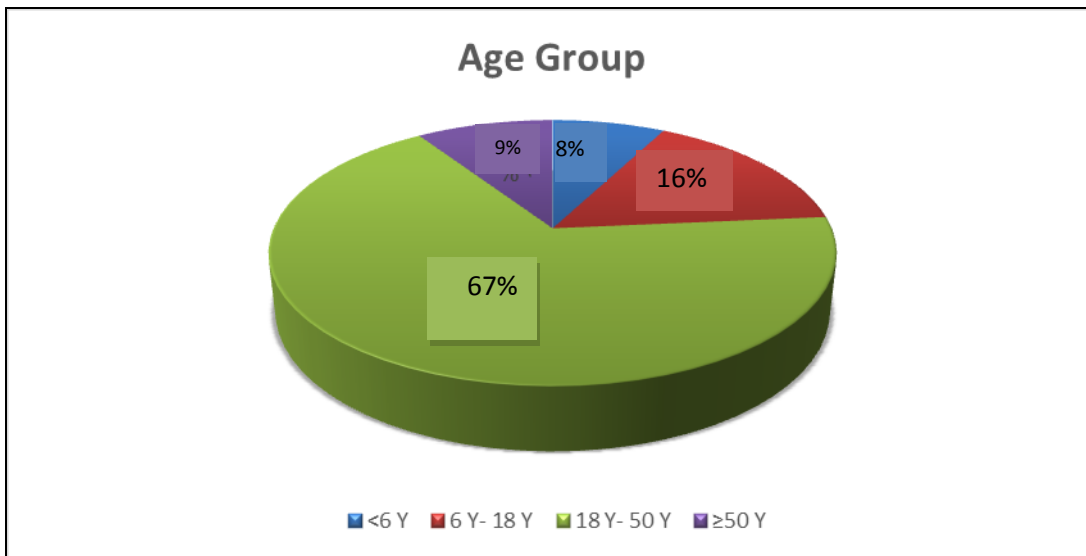


Figure (2): Distribution of the studied cases according to the age group.

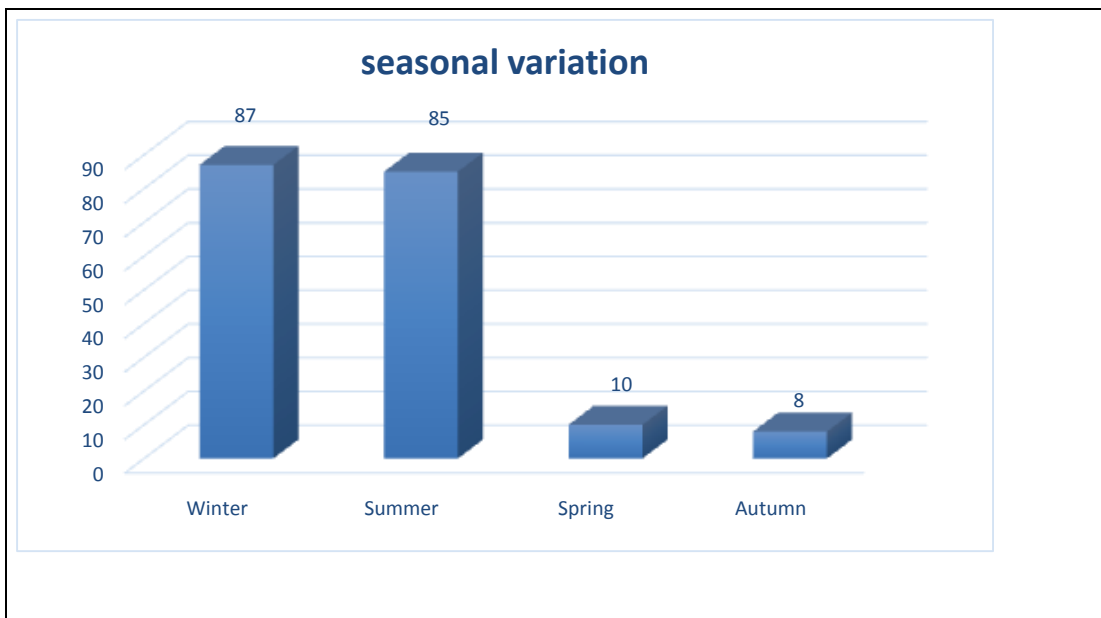


Figure (3): Distribution of the studied cases according to seasonal variation.

Table (1): Distribution of studied group regarding marital status

Marital status	No 190	%
Married	75	39.5
single	108	56.8
Divorced	2	1.1
Widow	1	0.5
Unknown	4	2.1

Most of the studied toxic deaths were single (108 cases), while only one case was a widow.

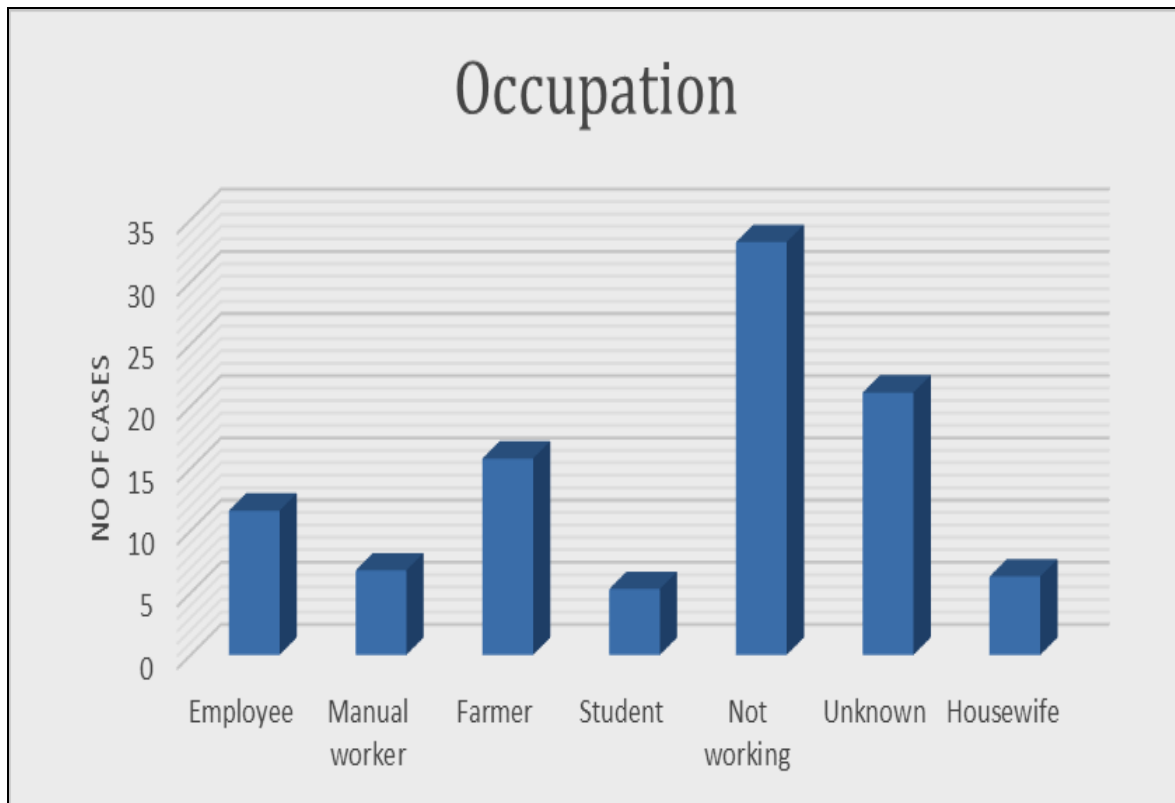


Figure (4): Distribution of the studied cases according to the occupation

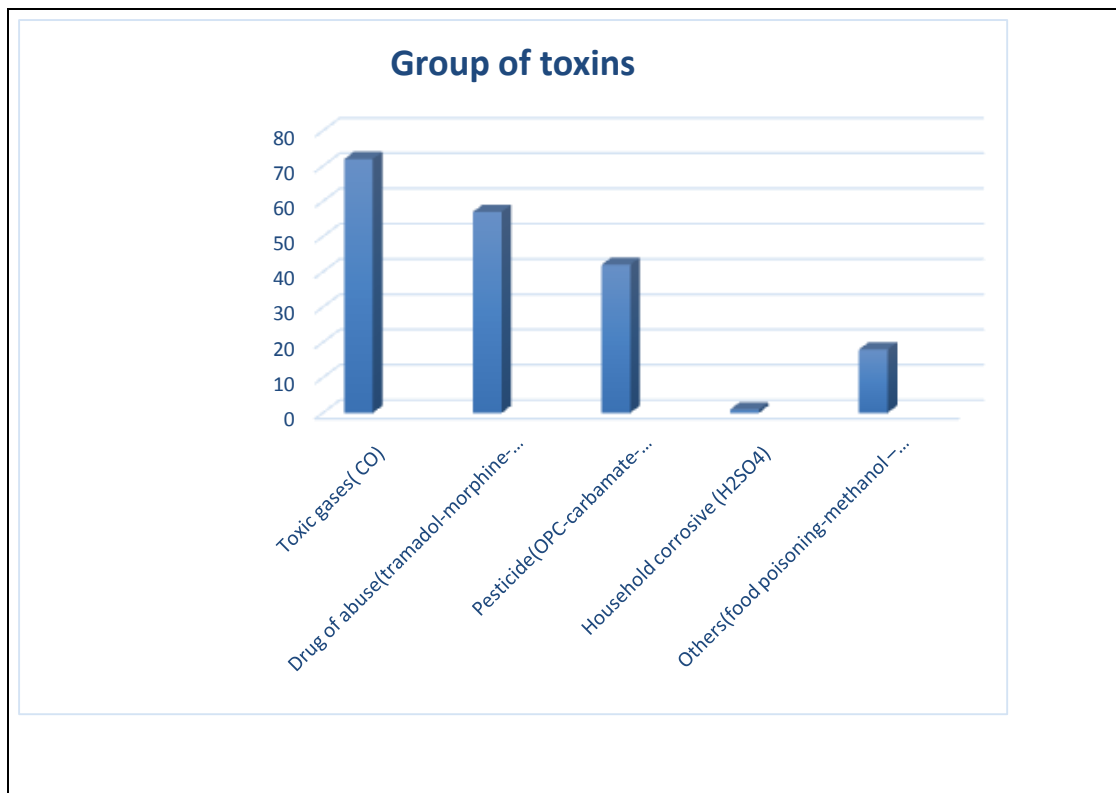


Figure (5): Distribution of the studied cases regarding the group of toxins caused death

Table (2): Deaths due to toxic gases (carbon monoxide)

Toxic gases		No (72)	%
Age		Mean age 27.22±19.66 (1-90)	
Sex	Male	39	54.2
	Female	33	45.8
Residence	Urban	55	76.4
	Rural	17	23.6
Season	Summer	15	20.8
	Winter	51	70.8
	Autumn	3	4.2
	Spring	3	4.2
Scene of death	Home	54	75.0
	Hospital	14	19.4
	Car	3	4.2
	Closed garage	1	1.4
Clinical presentation	Found dead	58	80.6
	Coma	14	19.4
Manner	Accidental	67	93.1
	Homicide	5	6.9
	Suicidal	0	0
	Unknown	0	0
Postmortem findings	Negative	1	1.4
	Positive	71	98.6

No significant sex difference in CO mortality of the studied cases.

It is clear that most of cases died accidentally in winter and in urban areas, 75% of them died at home.

Post mortem changes were +ve in 98.6% of the studied cases.

Table (3): Deaths due to drugs of abuse

Drugs of abuse		No (57)	%
Age	Mean age=33.05±11.12 (10-55)		
Types	Tramadol	24	42.1
	Morphine	6	10.5
	Heroin	5	8.8
	Cocaine	3	5.3
	Barbiturates	6	10.5
	Benzodiazepine	5	8.8
	Drug mixture	8	14
Sex	Male	49	86.0
	Female	8	14.0
Manner	Unknown	5	8.8
	Suicidal	9	15.8
	Accidental	42	73.7
	Homicidal	1	1.8
Scene of death	Home	26	45.6
	Hospital	29	50.9
	Street	2	3.5
Route	Unknown	1	1.8
	Oral	42	73.7
	Inhalation	0	0.0
	Injection	14	24.5
Medical intervention	Yes	29	50.9
	No	28	49.1
Postmortem analysis	Yes	48	84.2
	No	9	15.8

Tramadol was the commonest drug of abuse to cause death in this study as it caused 29 cases of total 57 drugs of abuse deaths. 86% of cases were males and 73.7% were accidental.

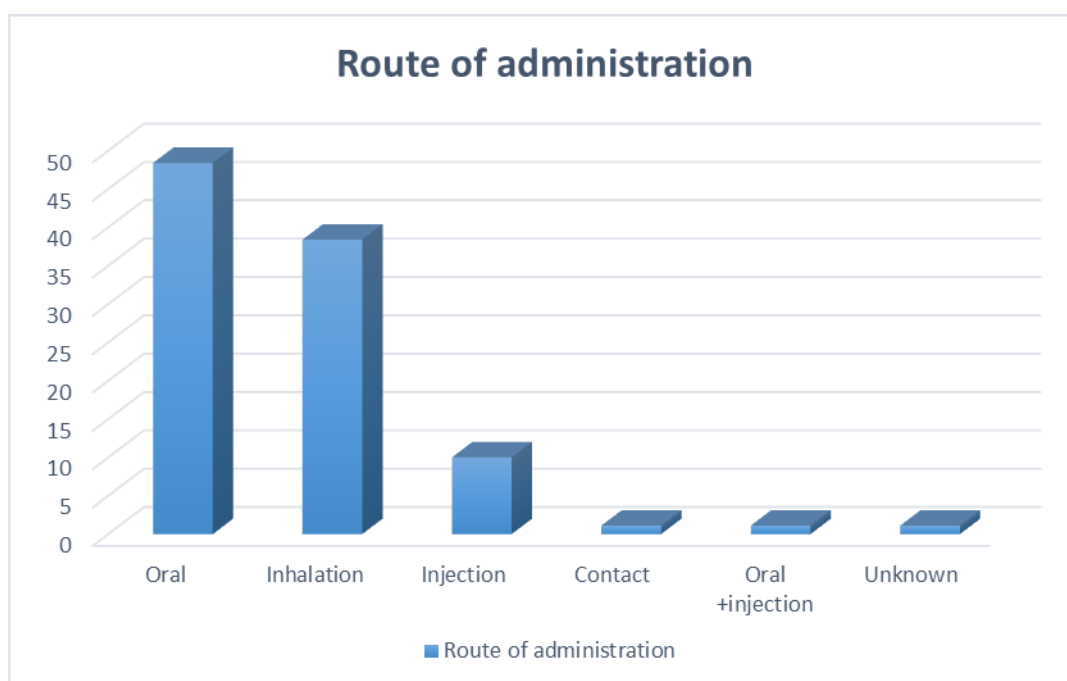
42 cases out of the total 57 cases had the drug orally, about half of the studied cases had medical intervention, and 84.2% gave positive results in postmortem analysis.

Table (4): Deaths due to pesticides

Pesticides		No (42)	%
Age		Mean age= 28.1±11.73 (4-55)	
Sex	Male	15	35.8
	Female	27	64.2
Residence	Urban	14	33.3
	Rural	28	66.7
Season	Summer	25	59.5
	Winter	12	28.57
	Autumn	3	7.14
	Spring	2	4.76
Clinical presentation	Found dead	7	16.7
	Cholinergic toxidrome	35	83.3
Manner	Suicide	27	64.3
	Accidental	11	26.2
	Homicide	4	9.5
	Unknown	0	0
Scene of death	Home	5	11.9
	Hospital	35	83.3
	Street	2	4.8

Female deaths were almost double male deaths, most of deaths were suicidal. Most of deaths happened in summer time and in rural areas. The

majority of the studied cases presented with cholinergic toxidrome and died in the hospital.

**Figure (6):** Distribution of studied cases regarding route of administration.

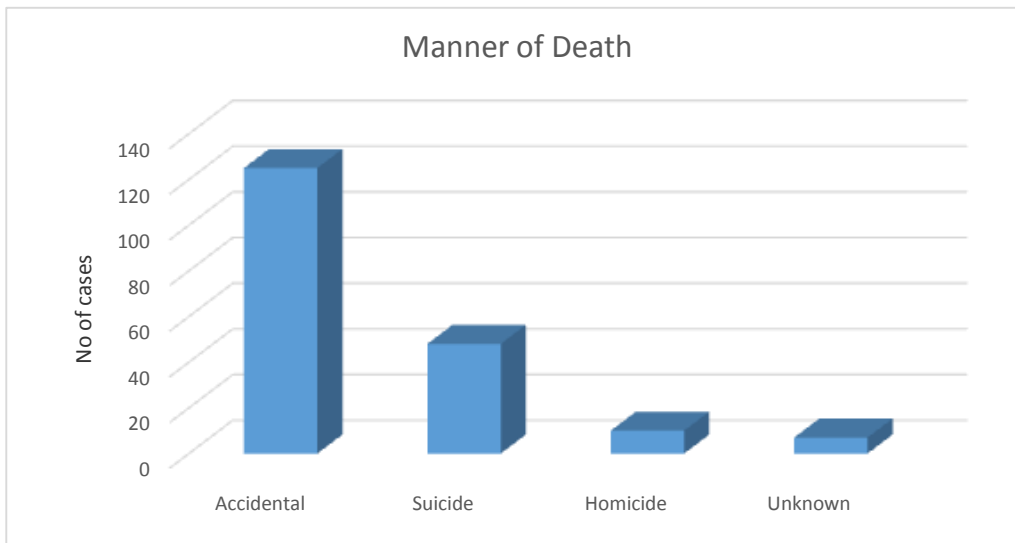


Figure (7): Distribution of studied cases regarding manner of death.

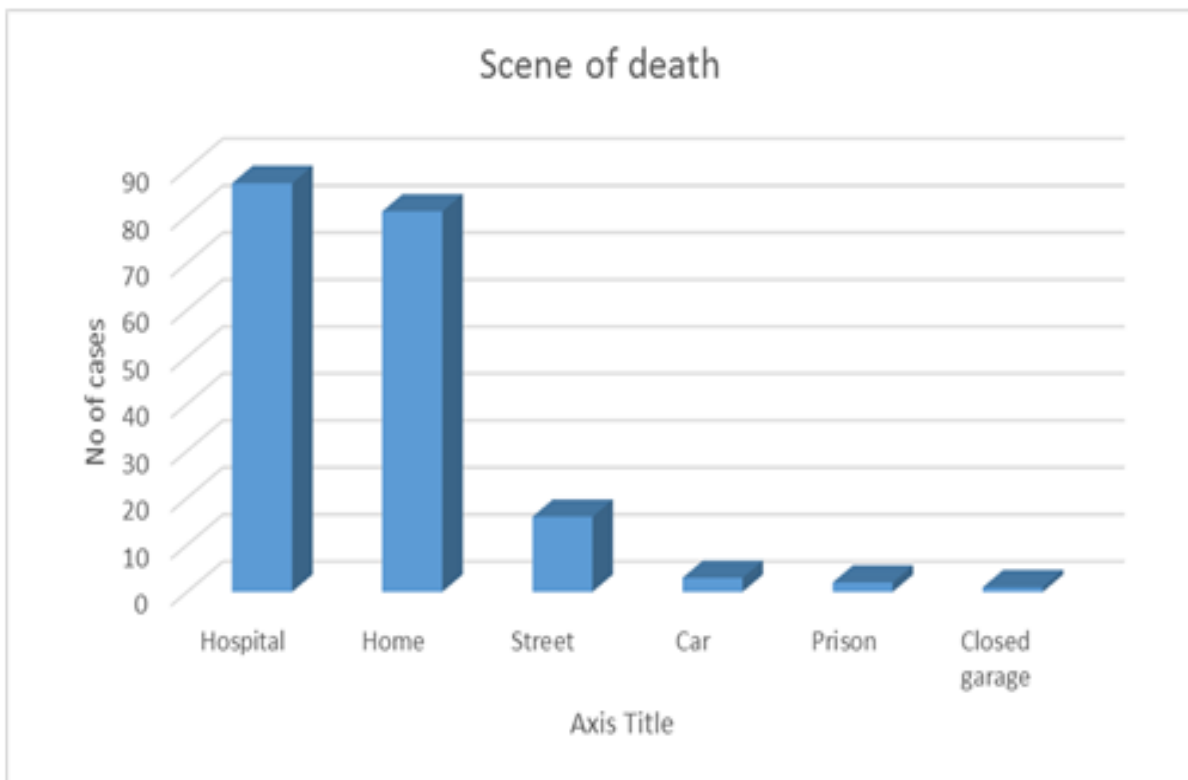


Figure (8): Distribution of the studied cases regarding scene of death.

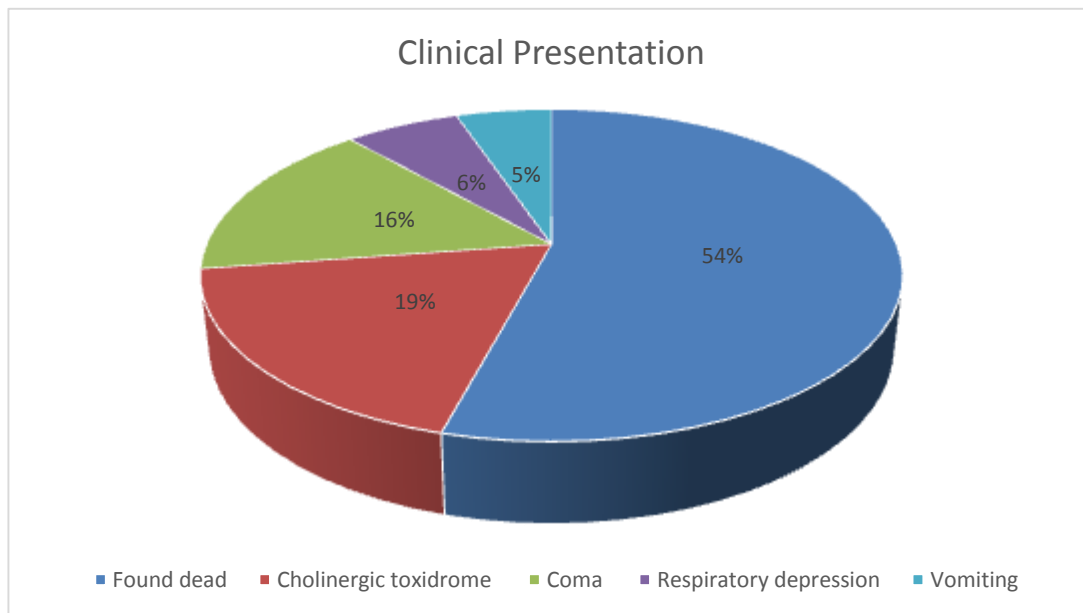


Figure (9): Distribution of the studied cases regarding clinical presentation.

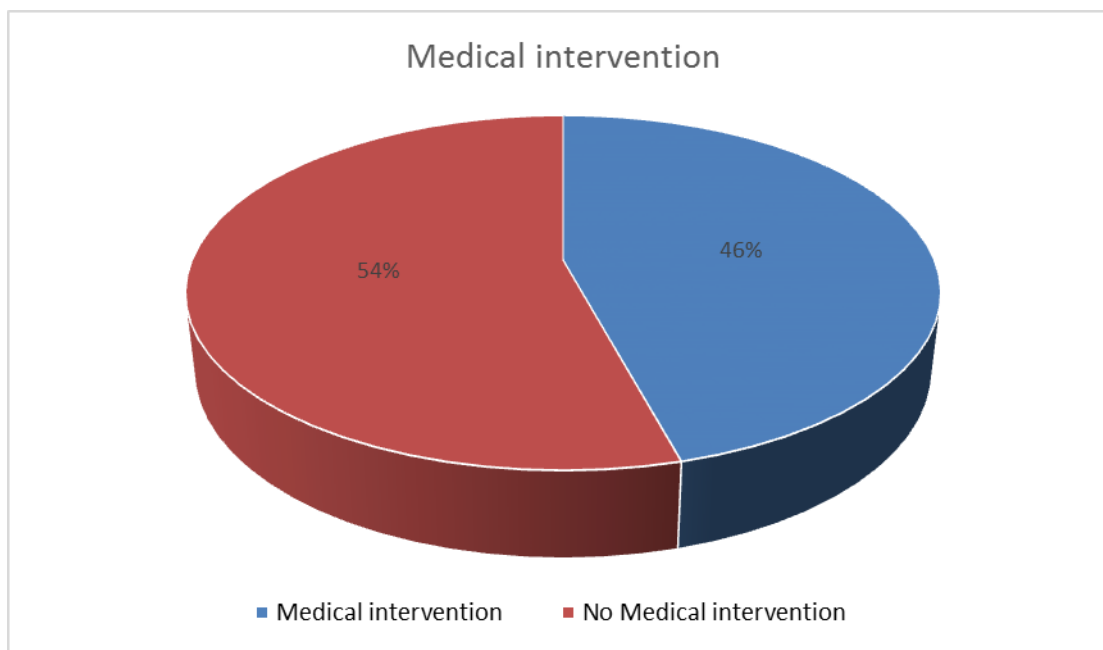


Figure (10): Distribution of studied cases regarding medical intervention.

DISCUSSION

In the present study prevalence of death due to suspected poisoning constituted (2.5%) of total autopsy cases registered in Zeinohom Morgue during the period from 2009 to 2013, with highest number of toxic deaths registered in 2011. Although it seems that suspected toxic deaths occurred at low frequency in Cairo & Giza

governorates, the possibility of under-enumeration and under-reporting of it must also be taken into account. The best proof for under estimation is that the annual report of Ain Shams University poisoning control center in 2011 recorded 61 toxic deaths, however the results of the present study revealed only (49) toxic deaths received by Zeinohom Morgue in the same year.

A study was carried out at forensic medicine department-Institute Of Medical Sciences, Banaras Hindu University, Varanasi, revealed that the number of unnatural death due to suspected poisoning from January 2009 through December 2013 was 896 cases out of a total of 10195 autopsies, that were done during the same period of time, constituting 8.79% of total autopsy cases, in these 5 consecutive years the prevalence was more or less static and average 20% (**Kumar et al., 2011**).

According to age groups in the present study, the largest number of toxic deaths was among age group 20-45 years (64.42%).

This finding can be justified by the fact that members of this age group are by nature more stress towards job, more aggressive, intolerant and irrational (**Masry & Tawfik, 2013**).

These results are different from the 2010 annual report of the American Association of Poison Control Centers which revealed that children under age of 5 represented up to 51 % of all poison deaths (**Bronstein et al., 2011**).

The high incidence of poisoning in the early adulthood and middle age deserve particular attention. This poisoning prone age group is subject to tremendous emotional and economic challenges in Egypt. Compared to other countries whether of Arabic or western culture, the greater majority of poisoning cases usually lie in the age group below 5 years of age. These observations strongly point to economic defies affecting principally the most vulnerable and conscious age group in Egypt. Other factors include interlinked emotional, social, financial and conjugal stresses (**Masry & Tawfik, 2013**).

Jesslin et al., conducted a study at Mysore, India included all poisoning cases attended to the JSS Medical college hospital and observed that majority of the poisoning incidences were seen in age group between 18-29 years. These differences between different regions might be due to geographical variation in the population (**Jesslin et al., 2010**).

It is evident from the present study that, among all intoxicated cases, males were dominant (60%) of the studied cases.

The results of the present study are in agreement with those obtained by Reddy, at Gulberga in India, who reported that 65.5% of intoxicated cases were males (**Reddy & Gunnar, 2006**).

Most studies that were conducted in different parts of India, male predominance was a common and constant feature in all, this reflects that males are more active in various social activities and customs and hence they are vulnerable for stress and tension. Males toxic deaths preponderance might also be attributed to more exposure of males to monsoon dependent cultivation practice and other occupational hazards (**Kumar et al., 2011**).

On the other hand, the results of the present study are in disagreement with the study of **Wu et al. (2012)**, who reported that the proportion of females among intoxicated cases was much higher than males (67%).

Interpretation of the results of the present study revealed that most of the intoxicated cases (83.7%), was from rural areas, inspite of this high percentage, there is underestimation of intoxicated cases as families of the deceased in rural areas are accustomed

to refuse notification of suspected toxic deaths especially in females for fear of autopsy. Poisoning has been regarded as a leading cause of death in rural and agricultural areas across the world (**Reddy, 2012**).

These results are similar to a study carried out at forensic medicine department, Banaras Hindu University, Varanasi, where most cases (87.39%) were from rural habitat, due to bulk of population live in rural areas with more agricultural activities (**Kumar & Pathak, 2014**).

In disagreement with the results of the present study, another study conducted in the Departments of Forensic Medicine Rajkot, India, found that the number of fatal poisoning were higher in people belong to urban area (**Kumar & Pathak, 2014**).

The results of the present study revealed that most of toxic deaths were prevalent among unmarried (56.5%). This may be due to depression associated with delayed marriage among girls, familial problems & absence of moral values which are reflected on teenagers in addition to our major problem of unemployment.

These results were different from other study made by Haloi et al., in Varanasi, India, which revealed that the number of toxic deaths were higher among married persons. They explained this finding by the predominance of economic problems after marriage and behavior of family members that increases stress (**Haloi et al., 2013**).

The results of the present study showed that among the whole intoxicated cases there was almost equal distribution in summer and winter with a very small proportion of cases in spring and autumn, however

toxic deaths by pesticides were predominant in summer (59.5%), where summer is the season of massive agricultural activities in addition to the prevalence of insects and rats and availability of organophosphorus compounds at homes. On the other hand, carbon monoxide poisoning was predominant in winter (70.8%), due to extensive use of heaters which were usually leaking.

An Indian study showed that the highest number of toxic deaths (41.07%) took place in summer, as this is the period of active agricultural activities when pesticide and insecticide are extensively used and also may be due to more chance of dehydration associated with food poisoning during this season (**Haloi et al., 2013**).

Maharani & Vijayakumari, found that more toxic deaths were recorded in summer (36%) (**Maharani & Vijayakumari, 2013**).

These observations are in contrast to another study where maximum cases of unnatural death due to poisoning was found to take place in winter (**Chakrabarty et al., 2014**).

The data of the present study showed that the largest number of toxic deaths had no occupation (33.2%), this reflects two major problems in Egypt of unemployment and lack of data. Among working people farmers were the highest toxic deaths. According to WHO; 99% of fatal poisonings occur in developing countries and particularly among agricultural workers (**Reddy, 2012**).

In a study carried out in India, the incidence of poisoning was higher in agriculture labourers. This can be explained by the fact that major population of India mainly depends

upon agricultural activities (**Varma & Kalele, 2011**).

On the other hand, another study made on cases of suspected fatal poisoning brought to Gauhati Medical College and Hospital for medicolegal autopsy, showed that maximum number of victims were students (28.12%), followed by domestic workers (21.87%) (**Haloi et al., 2013**).

The present study revealed that toxic gases (CO) was the most common cause of death (37.9%), followed by drugs of abuse then pesticides with percentage of (30%) and (22.1%) respectively, while house hold corrosives were the least group to cause death. This can be explained by increasing awareness of population of dangers of house hold toxic products through awareness campaigns through media, on the other hand, leak of CO gas in a closed place usually causes multiple deaths.

In contrast to these results, a retrospective study made in Tehran revealed that multiple drug poisoning, opioid overdose and aluminum phosphide toxicity were the most common causes of fatal acute intoxication (**Khodabandeh et al., 2013**).

In the united states as an example of developed countries, analgesics (11.5%) followed by cosmetics/personal care products (7.7%), household cleaning substances (7.3%), and sedatives/hypnotics/ antipsychotics (6.0%) represented the highest fatal poisoning frequency (**Bronstein et al., 2011**).

The results of the present study revealed that most cases died by carbon monoxide poisoning were males, CO toxic deaths were mainly in rural areas, more than half of the studied cases

were found dead at their homes during winter, almost all cases were accidental and the postmortem chemical analysis showed high CO levels in the blood.

In Ardabil, Iran, a study had been done on carbon monoxide fatal poisoning during the period (2008-2012), which showed that the rate of death from CO poisoning in male was (54.3%), (85.7%) of the cases died at home. In that study most of CO poisoning occurred in the winter, all cases were accidental with more prevalence in urban areas and the postmortem chemical analysis gave positive results in 85% of cases (**Esmail Farzaneh, 2015**).

According to the present study, drugs of abuse represented the second major group causing toxic deaths. Tramadol was the most common illicit drug used, followed by drug mixtures. Overdose toxic deaths were more common among males, the main route of exposure was the oral route, with accidental manner, and about half of cases died at hospital despite medical intervention. Among all drug overdose toxic deaths postmortem chemical analysis gave positive results in nearly 80% of cases while other cases were diagnosed by history and hospital reports.

In a study made in Budapest, Hungary between 1994 and 2012 on overdose toxic deaths caused by illicit drugs, they found that polydrug overdose was the main cause of death followed by heroin, males were predominant, accidental manner was the most common, most cases were found dead at their homes, the main route of exposure was injection and almost all cases showed positive results in the postmortem investigation (**Horváth et al., 2013**).

In the present study, tramadol was the first cause of illicit drug related mortality, due to its easy availability, so it became famous among youth especially males. An increasingly alarming phenomenon of tramadol abuse (Tramal, Amadol, Tramax, Contramal, Trama SR, Ultradol, Tramundin) had been heavily demonstrated in the Egyptian community in the last years. It seemed also that it is not only an Egyptian problem but also in neighboring countries (**Salem et al., 2007**).

The results of the present study revealed that pesticides represented the third most common cause of toxic deaths, with organophosphorus compounds occupying the first place among pesticides. Organophosphorus compounds represented the second cause of toxic deaths among individual toxins. About two-thirds of cases were females, it was common in rural areas, during summer, the manner was mainly suicidal, almost all cases presented by cholinergic toxidrome before death and died after admission to hospital.

A retrospective descriptive 4-year review of data from the autopsy reports was carried out at Morgue Department of Izmir, some of its results were agreeing with the results of the present study, while other results were different. The results showed that organophosphorus toxic deaths were more common among males, occurred mostly in summer and spring, in rural areas with suicide manner mainly, most of deaths were found dead at their houses (**Idiz et al., 2012**).

The results of the present study demonstrated that the oral route was the most common route of exposure (48.4%).

Maharani & Vijayakumari (2013), showed in their study at Tamil Nadu that all cases of unnatural deaths were due to oral consumption of poison.

Similarly, a study made by Boukatta et al, found that Ingestion was the major route of exposure (94.5%), followed by inhalation (5.5%) (**Boukatta et al., 2014**).

Interpretation of the results of the present study revealed that there was high percentage of the accidental manner of poisoning (65.8%).

These results are different from results of the study carried out in Varanasi, India which showed that suicidal manner was the most common (96.09%) (**Kumar & Pathak, 2014**).

Also, Out of the 245 cases, that were brought for post-mortem examination at the Department of Forensic Medicine, Kempegowda Institute of Medical sciences, Bangalore, Karnataka, (95.91%) were deaths due to suicidal poisoning due to familial and financial problems (**Gopal & Viswakanth, 2015**).

Regarding scene of death, most of the studied cases died at the hospital (45.8%) followed by death at home (42.6%).

A retrospective study of all the cases of suspected fatal poisoning brought to Gauhati Medical College and Hospital for medicolegal autopsy showed that majority of victims, 55(57.29%) died in the hospital. 22 (22.91%) cases died at home, whereas 19(19.79%) cases died on the way to the hospital (**Haloj et al., 2013**).

The results of the present study showed that the majority of toxic deaths (54.2%) were found dead, while (18.4%) of cases manifested by cholinergic toxidrome.

A retrospective, hospital record, based study conducted in Pokhara, Nepal, revealed that the clinical presentation of cases varied according to substance used. A total of 105 cases (65.6%) were manifested by excessive vomiting. Others presented with wide complex ventricular tachycardia and coma (**Maskey et al., 2012**).

The present study revealed that more than half cases (54.2%) did not receive medical intervention, as most cases either found dead or died immediately on arrival to the hospital. This finding can be explained as most cases registered in Zeinhom Morgue are those who were found dead or die rapidly before receiving any medical intervention, while those who enter the hospital with known toxin, stay in hospital for a period, receiving medical intervention and then died, usually don't go to the morgue, unless homicide is suspected. Families are always afraid of long legal procedures, spread of their personal life among people and having their deceased autopsied.

A retrospective study of all the cases of suspected fatal poisoning brought to Gauhati Medical College and Hospital for medico legal autopsy revealed that most of the patient 47(48.86%) were treated in Medical College Hospital while 41(42.7%) cases did not received any treatment (**Haloi et al., 2013**).

CONCLUSION & RECOMMENDATION

The pattern of toxic deaths in Cairo and Giza governorates varies in both epidemiological and medicolegal aspects, and although it seems that suspected poisoning occurs at low frequency in relation to the total number

of unnatural deaths, the possibility of under-referral and reporting of these cases to Zeinhom Morgue must also be taken into account.

Competent system of referral of suspected toxic deaths for medicolegal investigation and autopsy must be established, as most of toxic deaths aren't registered officially.

Full personal data, circumstances of toxic deaths and details of autopsy findings must be mentioned in the morgue files. Training of physicians about the accurate diagnosis and prompt management of poisoned victims would improve the rate of survival. The establishment of specialized toxicological units for detection and management of poisoning cases at all hospitals and primary health care centers could considerably minimize the morbidity and mortality due to poisoning. Peoples should be more informed of the dangers posed by poisons. More concerns must be directed towards drugs of abuse, especially tramadol, through the media and activating laws concerning drug addiction, these procedures will help in minimizing deaths from accidental drug overdose. More research work is needed to survey different aspects of fatal poisoning.

REFERENCES

- Abd-Elhaleem, Z. A., & Abd-Elkarim, M. A. (2011):** Pattern of food poisoning in Egypt, a retrospective study. *J Pharmacol Toxicol*;6(5):505–515.
- Boukatta, B., Bouazzaoui, G. El, & Houari, N. (2014):** An Epidemiological Study of Adult Acute Poisoning in Fez: Morocco. *J Clin Toxicol*;4(6):219–232.
- Bronstein, A. C., Spyker, D. A., Cantilena, L. R., Green, J. L., Rumack, B. H., & Dart, R. C. (2011):** 2010 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th Annual Report. *Clinical Toxicology (Philadelphia, Pa.)*;49(10):910–941.
- Chakrabarty, P., Tudu, N., & Saren, A. (2014):** Epidemiology of unnatural death from suspected poisoning: an autopsy based study. *International Journal of Science and Research (IJSR)*;3:178–181.
- Eddleston, M., & Phillips, M. R. (2004):** Self poisoning with pesticides. *BMJ (Clinical Research Ed.)*;328(7430):42–44.
- Esmail Farzaneh, F. N. (2015):** Epidemiology of carbon monoxide gas poisoning deaths in Ardabil city, 2008-13. *International Journal of Research in Medical Sciences*;3(4):929–932.
- Gamaluddin, H., Seddawy, M. El, Khayrat, M., & Sakr, M. (2006):** Evaluation of cases of acute poisoning received at the poison control centre of Ain Shams University Hospitals during the year 2005. *Ain Shams J Forensic Med Clin Toxicol*;6:13–24.
- Gopal, B., & Viswakanth, B. (2015):** A Retrospective Analysis of Suicidal Poisoning Deaths in a Metropolitan City of South India. *Journal of Indian Academy of Forensic Medicine*;37(2):140–143.
- Gunnell, D., Eddleston, M., Phillips, M. R., & Konradsen, F. (2007):** The global distribution of fatal pesticide self-poisoning: systematic review. *BMC Public Health*;7(1):350–357.
- Haloi, M. M. M. D. M., Haloi, M. M., & Patowary, A. (2013):** Death due to poisoning in District of Kamrup, Assam A Medico-legal Study. *J Indian Acad Forensic Medicine*;35(1):17–20.
- Hassan, D. A., Ghaleb, S. S., Ahmed, M. A. E., & Zaki. (2015):** Pattern of Suicidal Methods Used in Minofiya, Gharbiya and Kafr Elshekh Governorates (2008- 2012). *Journal of Forensic Research*;6(1):1.
- Horváth, M., Dunay, G., Csonka, R., & Keller, É. (2013):** Deadly heroin or the death of heroin -- overdoses caused by illicit drugs of abuse in Budapest, Hungary between 1994 and 2012. *Official Journal of the Hungarian Association of Psychopharmacology*;15(4):253–259.
- Idiz, N., Karakus, A., & Dalgıç, M. (2012):** The forensic deaths caused by pesticide poisoning between the years 2006 and 2009 in Izmir, Turkey. *Journal of Forensic Sciences*;57(4):1014–1016.
- Illinois Poison Center. (2015):** 2015 Annual Meeting of the North American Congress of Clinical Toxicology (NACCT). *Clinical Toxicology*;53(5):645–775.
- Jesslin, J., Adepu, R., & Churi, S. (2010):** Assessment of prevalence and mortality incidences due to poisoning in a South Indian tertiary

- care teaching hospital. *Indian Journal of Pharmaceutical Sciences*;72(5):587–591.
- Khodabandeh, F., Emamhadi, M. ., & Mostafazadeh, B. (2013):** Epidemiological Assessment of acute poisoning Death—One year Survey. *International Journal of Medical Toxicology and Forensic Medicine*;2(3):103–109.
- Kumar, A., & Pathak, M. K. (2014):** Epidemiology of Unnatural Death Due to Suspected Poisoning in Varanasi , India;3(9):2012–2015.
- Kumar, S., Pathak, A., & Mangal, H. (2011):** Trends of Fatal Poisoning In Saurashtra Region of Gujarat (A Prospective Study). *J Indian Acad Forensic Med.*;33(3):87–95.
- Lam, S.-M., Lau, A. C.-W., & Yan, W.-W. (2010):** Over 8 years experience on severe acute poisoning requiring intensive care in Hong Kong, China. *Human & Experimental Toxicology*;29(9):757–65.
- Maharani, B., & Vijayakumari, N. (2013):** Profile of poisoning cases in a tertiary care Hospital, Tamil Nadu, India. *Journal of Applied Pharmaceutical Science*;3(1):91.
- Maskey, A., Parajuli, M., Kohli, S., Baral, S., Basnet, S., & Poudel, N. (2012):** Scenario of Poisoning Cases in Adults Admitted in Manipal Teaching Hospital, Pokhara, Nepal. *Nepal Journal of Medical Sciences*;1(1):23–26.
- Masry, M. El, & Tawfik, H. M. H. (2013):** 2011 Annual Report of the Poison Control Centre of Ain Shams University Hospital, Cairo, Egypt. *Ain Shams Journal of Forensic Medicine*;20(1):10–17.
- Pitts, S. R., Niska, R. W., Xu, J., & Burt, C. W. (2008):** National hospital ambulatory medical care survey: 2006 emergency department summary. *Natl Health Stat Report*;7(7):1–38.
- Reddy, K.S.N & Gunnar, DG. P. (2006):** Study of op. poisoning cases in Gulberga Indian. *Indian Journal of Forensic Medicine and Toxicology*;2:194–197.
- Reddy, N. K. S. (2012):** The essentials of forensic medicine and toxicology (31st ed., pp. 458–467). K. Suguna Devi.
- Salem, E. A., Delk, J. J. R., Wilson, S. K., Bissada, N. K., Hellstrom, W. J. G., & Cleves, M. A. (2007):** Tramadol HCL has promise in on demand use to treat premature ejaculation. In *Journal of sexual medicine* (Vol. 5, pp. 188–193).
- Sut, N., & Memis, D. (2008):** Intensive care costs of acute poisoning cases. *Clinical Toxicology (Philadelphia, Pa.)*;46(5):457–460.
- Varma, N. M., & Kalele, S. D. (2011):** Original Research Paper Study of Profile of Deaths due to Poisoning in Bhavnagar Region. *J Indian Acad Forensic Med.*;33(4):971–973.
- Wiegand, T. J., Wax, P. M., Schwartz, T., Finkelstein, Y., Gorodetsky, R., & Brent, J. (2012):** The Toxicology Investigators Consortium Case Registry—the 2011 experience. *Journal of Medical Toxicology: Official Journal of the American College of Medical Toxicology*;8(4):360–377.
- Wu, K. C.-C., Chen, Y.-Y., & Yip, P. S. F. (2012):** Suicide methods in Asia: implications in suicide prevention. *International Journal of Environmental Research and Public Health*;9(4):1135–1158.

الملخص العربي

**النمط الطبى الشرعى لحالات الوفيات بالتسمم فى محافظتى
القاهرة والجيزة دراسة إحصائية مرجعية خلال الفترة من 2009-2013**
د/ مارسيل رمسيس هارون¹، د/ محمد كامل أحمد¹، د/ أحمد حسين رزق¹، د/ اسلام سامى متولى¹، ايمان
صلاح عز الرجال²
¹ قسم الطب الشرعى و السموم الأكلينيكية، كلية الطب، جامعة بنها ، ² معيد بقسم الطب الشرعى و السموم
الأكلينيكية، كلية الطب، جامعة بنها

نبذة عن الموضوع: يعتبر التسمم الحاد من أحد أهم أسباب الوفاة الغير طبيعية والتي قد تتأثر بمجموعة من العوامل الوبائية والاجتماعية والثقافية و الدينية المختلفة. **الهدف من العمل:** دراسة النمط الطبى الشرعى لحالات الوفيات بالتسمم فى محافظتى القاهرة والجيزة خلال الفترة من 2009 الى 2013، وذلك عن طريق عمل تحليل بأثر رجعى للتقارير الطبية الشرعية لحالات الوفيات بالتسمم التى استقبلتها مشرحة زينهم. **النتائج:** مثلت الوفاة عن طريق التسمم 2.5 ٪ من مجموع الوفيات المسجلة فى مشرحة زينهم . الوفاة عن طريق التسمم كانت اكثر انتشارا وسط الذكور، اكثر الوفيات حدثت بشكل عرضى، تم تعاطى السم عن طريق الفم فى معظم الحالات، كان السم الأكثر شيوعا هو غاز أول أكسيد الكربون. **الخلاصة و التوصيات:** تنوع نمط الوفيات الناتجة عن التسمم فى محافظتى القاهرة و الجيزة فى الجوانب الوبائية و الطبية الشرعية ، الا انه يجب ان يؤخذ بعين الاعتبار انخفاض معدلات الابلاغ عن حالات الوفاة نتيجة التسمم وعدم احالاتها الى مشرحة زينهم. يجب وضع نظام فعال من أجل إحالة حالات الوفاة نتيجة التسمم للطب شرعى لاجراء الصفة التشريحية للجنة وغيرها من الفحوص الطبية الشرعية .