Analysis of the Year 2007 Data of Dokuz Eylül University Drug and Poison Information Center, Turkey

Dokuz Eylül Üniversitesi İlaç ve Zehir Bilgi Merkezi 2007 Yılı Verilerinin Analizi

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Geliş Tarihi/*Received:* 01.06.2009
Kabul Tarihi/*Accepted:* 15.12.2009

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ABSTRACT Objective: We investigated the etiological and demographical characteristics of exposures to drugs and poisons reported to the Dokuz Eylul University Drug and Poison Information Center (DPIC), in 2007. **Material and Methods:** The data regarding demographic details of the cases and involving substance(s), route and reason for the exposure, date, time, site and circumstances of poisonings are reviewed retrospectively. Beside these, clinical effects of the incidents, the recommendations by DPIC and outcomes of the patients were also evaluated from the standard data forms. Descriptive statistics, contingency tables and Pearson Chi-square test was performed to analyze the data. **Results:** DPIC received 2576 calls in 2007 and most of them were related to poisoning incidents. A vast majority (97%) of these calls was made from the health care facilities and 73.3 % of them were from Izmir. Most of the incidents were intentional attempts (65.5%) in nature and there was a female predominance (χ^2=385.03, P<0.001). Rate of unintentional exposures was significantly higher in 0-12 year-old children than in the 13-18 year-old teenagers (χ^2=374.59, P<0.001). Ingestion was the most common route of exposure (92.7%). Medications were the predominant substances in the exposures (72.5%) followed by chemicals, metals, cosmetics (4.7%) and alcohol (4.7%). Analgesics (15.5%) and antidepressants (13.5%) were leading drugs involved in these events, particularly paracetamol and amitriptyline (11.8 and 3.9%)respectively. Recommended treatments by DPIC included activated charcoal (24.5%), supportive care (23.1%), gastric lavage (15.0%), antidotes (2.2%) and skin decontamination. There were two mortalities (0.08%) associated with a scorpion sting and carbon monoxide inhalation. **Conclusion:** Analgesics and antidepressants were found to be the main causes of poisoning exposures in the review of DPIC reports. Research studies can be accomplished in this field with the assistance of national poisoning database system which compiles the information gained from all poison information centers in Turkey.

Key Words: Poison control centers; poisoning

ÖZET Amaç: Bu çalışmada, Dokuz Eylül Üniversitesi İlaç ve Zehir Bilgi Merkezi'ne (İZBM) 2007 yılı içinde bildirilen ilaç ve diğer zehirlenme olgularının etyolojik ve demografik özellikleri incelenmiştir. **Gereç ve Yöntemler:** Olguların ve kullanılan maddelerin demografik özelliklerine, alım yolu ve nedenine ilişkin veriler, zehirlenmelerin tarih, zaman, yer ve koşulları geriye dönük olarak gözden geçirildi. Bunların dışında, olayların klinik etkileri, İZBM'in önerileri ve hasta sonuçları da standart veri formları aracılığı ile değerlendirildi. Verilerin değerlendirilmesinde tanımlayıcı istatistikler, olumsallık tabloları ve Pearson Ki-kare testi kullanıldı. **Bulgular:** 2007 yılında İZBM'e toplam 2576 çağrı yapılmış olup, bunların büyük kısmı zehirlenme olayları ile ilişkili idi. Bu çağrıların çok büyük bölümü (%97) sağlık kuruluşlarından ve bunların da %73.3'ü İzmir'den yapıldı. Olayların çoğu kasıtlı yapılmış girişimler (%65.5) niteliğinde olup olgular ağırlıklı olarak kadınlardan oluşmakta idi (χ^2=385,03, P<0.001). Kasti nitelik taşımayan olayların sıklığı 0-12 yaş arasındaki çocuklarda 13-18 yaş arası ergenlerde olduğundan anlamlı olarak daha yüksek idi (χ^2=374,59, P<0.001). En sık karşılaşılan maruziyet şekli ağızdan alım şeklinde idi (%92.7). Maruziyetlerde en fazla karşılaşılan maddeler ilaçlar (%72.5) olup, bunları, kimyasallar, metaller, kozmetikler (%4.7) ve alkol (%4.7) izlemekte idi. Zehirlenme olaylarında en çok karşılaşılan ilaç grubu analjezikler (%15.5) ve antidepresanlar (%13.5) olup özellikle parasetamol ve amitriptilinin başı çektiği gözlendi (sırası ile %11.8 ve %3.9). İZBM tarafından önerilen sağaltım yöntemleri arasında aktif kömür (%24.5), destek tedavi (%23.1), mide lavajı (%15.0), antidotlar (%2.2) ve deriyi arındırma yöntemleri, sayılabilir. Akrep sokması ve karbon monoksid inhalasyonuna bağlı iki ölüm olgusu (%0.08) gözlenmiştir. **Sonuç:** İZBM raporları incelendiğinde en önemli zehirlenme nedenlerinin analjezikler ve antidepresanlar olduğu görülmüştür. Türkiye'deki tüm zehirlenme bilgi merkezlerinden gelen bilgileri toplayan ulusal zehirlenme veritabanı sistemleri yardımı ile bu alanda araştırma çalışmaları gerçekleştirilebilir.

Anahtar Kelimeler: Zehir kontrol merkezleri; zehirlenme

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Turkiye Klinikleri J Med Sci 2010;30(5):1622-30

New advancements in the field of medicine, particularly after World War II, led to discovery of new drugs and chemicals with a high potential of harmful effects despite being therapeutically effective. For this reason, the medical community decided to build a response mechanism to deal with the poisoning incidents. In the late 1940s special toxicology wards were founded for this purpose in Europe. In the United States (US), first poison information center date back to 1953.[1] On the other hand, first poison information center in Turkey, Refik Saydam Hifzisihha Poison Information Center, was established in 1984. Dokuz Eylul University Drug and Poison Information Center (DPIC) started to serve in the constitution of School of Medicine, Pharmacology Department in 1993.[2] Since then, DPIC continues to present all of its experiences and facilities to the health professionals' and public's service with the help of experienced physicians and pharmacologists trained on Clinic Toxicology. DPIC provides consultation about undesirable adverse effects of drugs and poisons (toxic substance) by telephone 24 hours a day. Poisoning incidents are public health problems that are much more common than they are appreciated. The main aims of DPIC are to provide effective and safe drug use and to decrease morbidities, mortalities and the cost of treatments. Moreover, in case of poisoning, it also provides guidance for treatment strategies by giving correct, current and comprehensive information rapidly. DPIC receives phone calls from every city the country but mainly serves the Aegean region of Turkey with a population over 9 million (2007 census).

The aim of this study was to investigate the etiological, demographical and clinical characteristics of exposures reported to the DPIC in 2007. Epidemiological data on the poisoning incidents are extremely limited in Turkey. This kind of reports will give beneficial information to physicians, researchers and executives of health management by enlighting recent situation and characteristics of poisonings events in Turkey. The data which have been used for previous studies on this area usually gathered from the patients' records who were admitted to the emergency departments of the university hospitals.[3-15]

MATERIAL AND METHODS

This study was approved by the Institutional Ethics Committee of the Dokuz Eylul University, School of Medicine. A cross-sectional, descriptive review was conducted in all cases of poisonings reported to the Dokuz Eylul University Drug and Poison Information Center (DPIC) in 2007.

All data [including demographic details such as identification of the caller and health care facility, involving substance(s), route and reason for the incident, date, time, site and circumstances of poisoning (unintentional, intentional or unknown), clinical effects, time elapsing until consultation, methods of management, treatment recommendations and outcomes of the patients] were collected by telephone consultations, and recorded on standard data forms. Clinical outcome was based on the assessment of health professionals who handled the call. The clinical severity of manifestations was assessed according to EAPCCT/IPCS Poisoning Severity Score and then graded as asymptomatic, mild, moderate or severe.[16] The patients were categorized into age groups as <6 years, 6 to 12, 13 to 18 for children; 19 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69 and >69 years for adults. The medications were also classified into nine major groups and twenty subgroups according to the World Health Organization (WHO) Anatomical Therapeutic Chemical (ATC) classification index.

All the data were then entered into a new software named as "Ruber" that was developed for poison information centers with guidance from the DPIC. The software allows DPIC users to enter data and perform queries using the various fields of the recorded case. All of the DPIC data between 1993 and 2008 were stored in a database using Microsoft SQL Server 2005. Additionally, a web-based reporting application was developed for DPIC users. Microsoft SQL Server 2005 Reporting Service was used for implementing reports. This web-based reporting application allows authorized DPIC users to perform queries and drill-down re-

ports. Query results and reports can also be exported to the various file formats.

Statistical analyses were performed by using the statistical packages SPSS 15 for Windows and MINITAB 14. Descriptive statistics were calculated for numerical variables and mean and standard deviation were expressed as mean ± SD. Pearson Chi-square test was performed for testing the association between variables in contingency tables. A p value < 0.05 was considered statistically significant. Spearman's correlation coefficient (Spearman's rho) was used for measuring the strength of linear association of the ordinal variables. Data in this paper are provided as tables and charts and drawn using Microsoft® Office Excel 2003.

RESULTS

In 2007, DPIC received 2576 total phone calls concerning poisoning and information calls; 2566 (99.6%) of them were related to cases of poison exposure. Calls for drug information constituted 0.4% (10) of all calls.

Ninety-seven percent (2,503) of the calls came from the health care facilities, 73.3% (1,889) of total calls came from Izmir and 26.7% (687) came from other cities (6.3% Manisa, 2.4% Aydin, 1.8% Usak, 16.2% other cities). Ninety-nine percent of total calls were from the physicians. Residences (1,999, 78.0%) were the most common site for poisoning incidents.

The number of reported incidents was higher in December and November (9.9% and 9.5%, respectively). The vast majority of the cases (2542, 99.0%) were acute at the time of the call, followed in frequency by chronic (22, 0.9%) and unknown durations (2, 0.1%). Among all cases, the most common route of exposure was ingestion (2379, 92.7%) followed by inhalation/nasal route (88, 3.4%), insects bites/stings (54, 2.1%) and dermal route (22, 0.9%).

The time elapsed between the incidents and calls to the DPIC was as follows: 1309 cases (51.0%) within two hours, 600 (23.4%) between 2 and 4 hours, 350 (13.6%) between 4 and 8 hours, 162 (6.3%) between 8 and 24 hours, 31 (1.2%) more than one day. In 114 (4.4%) of the cases, the exposure time was unknown. Median time elapsed from exposures to the calls was 1.5 h. Mean elapsed time was 3.1 ± 6.8 h (2.6 ± 4.3 and 3.5 ± 8.3 for children and adults, respectively). The majority of phone calls (1,408, 54.7%) were received between 18:00 and 23:59 (Table 1). When the age groups were compared with respect to elapsed time period, a significant relation was found between the patients aged 0-5 years and those aged 6-18 years (χ^2=53.38, P<0.001). This relation showed that younger the patient was, earlier the calls for information were made, indicating a mild positive correlation between the elapsing time (≤2 and >2 hour) and the age groups (0-5, 6-18) (Spearman's rho=0.223, P<0.001).

Most of the poisoning exposures that were reported to DPIC were in adults (1,398, 54.5%, Table 2). The mean age of the patients was 21.5 ± 14.6 (8.5 ± 6.1 for children and 29.7 ± 12.3 for adults, respectively), most of them being between 13 and 39 years-old group (1,636, 63.8%, Table 2). The median age of the patients was 20.0 (10.5 for children and 27.0 for adults, respectively). In 2007, a female predominance was found among the cases except for patients in the age groups of 0 – 5 years and 50 – 59 years. The female-to-male ratio was 2:1.

Most of these incidents were intentionally performed (1,680, 65.5%, Table 3). The predominance of these intentional exposures (suicide attempt, misuse or abuse) was found in all age groups, except in 0-12 years-old children. Unintentional exposures constituted majority of the cases in 0-12 years old children (497, 84.1%) and this type of exposure was significantly higher in this age group

TABLE 1: Phone call frequencies by time intervals.

Time	No. of calls	% of total
00:00-05:59	405	15.7
06:00-11:59	189	7.3
12:00-17:59	485	18.8
18:00-23:59	1,408	54.7
Unknown Time	89	3.5
Total	2,576	100.0

TABLE 2: Gender and age distribution of exposures.

	Age																			
	Unknown Age		0-5 years		6-12 years		13-18 years		19-29 years		30-39 years		40-49 years		50-59 years		≥60 years		Total	
Gender	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	15	0.9	204	12.6	62	3.8	403	24.9	574	35.5	198	12.2	84	5.2	37	2.3	41	2.5	1618	63.1
Male	5	0.6	216	26.8	43	5.3	109	13.5	201	24.9	111	13.8	63	7.8	37	4.6	21	2.6	806	31.4
Unknown	28	19.7	55	38.7	11	7.7	17	12.0	17	12.0	6	4.2	4	2.8	0	0.0	4	2.8	142	5.5
Total	48	1.9	475	18.5	116	4.5	529	20.6	792	30.9	315	12.3	151	5.9	74	2.9	66	2.6	2566	100.0

compared to the 13-18 year-old teenagers (χ^2=374.59, P<0.001). In accordance with this finding, number of intentional exposures were significantly higher in adults than the patients aged 0-18 years (χ^2=202.48, P<0.001, Table 3). Incidence of intentional exposures were significantly higher in females compared to males (c^2=385.03, P<0.001, Table 4).

Exposure to multiple substances occurred in 121 cases. Medications were the most frequent substances (1949, 72.5%) followed by chemicals, metals, cosmetics (126, 4.7%) and alcohol (126, 4.7%, Table 5). The incidents involving medications were more common in women than in men (Table 5). When the substance type (medications etc.) and the age groups (0-18 years, >19 years) were compared, no significant association could be found (χ^2=0.39, P=0.53). The medication related events were significantly higher in teenagers (13-18 years) than in children (0-12 years) (c^2=20.27, P<0.001, Table 6).

The frequency distributions showed that nervous system medications were the most frequent offending agents. Among these, analgesics and antidepressants were responsible for most of the cases, accounting for 15.5% and 13.5% of all medication exposures, respectively. Paracetamol was the most commonly ingested medication both among nervous system agents and all medications (445, 22.4% and 11.8%, respectively). Amitriptyline was the most frequently ingested medication among antidepressants (146, 28.6% of the antidepressants and 3.9 % of all medications). Musculoskeletal system medications (470, 12.4% of all medications, Table 7) were the second leading cause of drug exposures, followed by drugs affecting alimentary tract and metabolism (408, 10.8%, Table 7) as well as anti-infectives/ antimicrobials (273, 7.2%, Table 7).

TABLE 3: Distribution of motivations for exposure by age.

	Motivations							
Age	Unintentional		Intentional		Unknown		Total	
Groups	No.	%	No.	%	No.	%	No.	%
<6 years	421	88.6	43	9.1	11	2.3	475	18.5
6-12 years	76	65.5	28	24.1	12	10.3	116	4.5
13-18 years	46	8.7	465	87.9	18	3.4	529	20.6
≥19 years	235	16.8	1,114	79.7	49	3.5	1,398	54.5
Unknown	10	20.8	30	62.5	8	16.7	48	1.9
Total	788	30.7	1,680	65.5	98	3.8	2,566	100.0

TABLE 4: Distribution of motivations for exposure by gender.

	Motivations							
	Unintentional		Intentional		Unknown		Total	
Gender	No.	%	No.	%	No.	%	No.	%
Female	357	22.1	1,208	74.7	53	3.3	1,618	63.1
Male	357	44.3	417	51.7	32	4.0	806	31.4
Unknown	74	52.1	55	38.7	13	9.2	142	5.5
Total	788	30.7	1,680	65.5	98	3.8	2,566	100.0

The cases were divided into groups regarding amount of exposed substances as toxic (1,262, 49.2%), non-toxic (886, 34.5%) and unknown (418, 16.3%). The majority (777, 87.7%) of cases with non-toxic amounts of exposure and 915 (72.5%) of cases with toxic amounts of exposure were clinically asymptomatic. A significant association was

TABLE 5: The distribution of the cases by gender and substance categories.*

	Substances																			
	Medication		Chemicals Metals Cosmetics		Alcohol		Pesticides Rodenticides Herbicides		Cleaning Products		Mushroom Plants Food		Bites Stings		Other / Unknown		Gases		Total	
Gender	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	1,351	80.7	41	2.4	52	3.1	57	3.4	49	2.9	28	1.7	33	2.0	35	2.1	29	1.7	1675	62.3
Male	511	59.1	71	8.2	65	7.5	55	6.4	57	6.6	32	3.7	29	3.4	19	2.2	26	3.0	865	32.2
Unknown	87	59.2	14	9.5	9	6.1	6	4.1	11	7.5	6	4.1	2	1.4	7	4.8	5	3.4	147	5.5
Total	1,949	72.5	126	4.7	126	4.7	118	4.4	117	4.4	66	2.5	64	2.4	61	2.3	60	2.2	2687	100.0

* Actual number of the cases in each substance categories might be lower than total number of exposures because of the fact that there are some cases with multiple exposures to various substances.

TABLE 6: The distribution of cases of poison exposure by substance categories and age*

	Age Groups									
	0-12 years		13-18 years		≥19 years		Unknown		Total	
Substances	No.	%	No.	%	No.	%	No.	%	No.	%
Medication	346	58.3	475	87.6	1,100	73.4	28	51.9	1949	72.5
Chemicals, Metals, Cosmetics	69	11.6	8	1.5	46	3.1	3	5.6	126	4.7
Alcohol	10	1.7	15	2.8	94	6.3	7	13.0	126	4.7
Pesticides, Rodenticides, Herbicides	32	5.4	16	3.0	69	4.6	1	1.9	118	4.4
Cleaning Products	61	10.3	8	1.5	48	3.2	0	0.0	117	4.4
Mushroom, Plants, Food	21	3.5	3	0.6	37	2.5	5	9.3	66	2.5
Bites/Stings	19	3.2	4	0.7	40	2.7	1	1.9	64	2.4
Other / Unknown	25	4.2	8	1.5	23	1.5	5	9.3	61	2.3
Gases	10	1.7	5	0.9	41	2.7	4	7.4	60	2.2
Total	593	100.0	542	100.0	1498	100.0	54	100.0	2687	100.0

* Actual number of the cases in each substance categories might be lower than total number of exposures because of the fact that there are some cases with multiple exposures to various substances.

found between grades of exposures and presence of clinical symptoms (χ^2=69.96, P<0.001).

Most of the cases (1998, 77.9%) reported to DPIC had no symptoms. However minor and moderate symptoms are reported in 16.3% (417) and 3.3% (84) of the cases, respectively; whereas only a minority of the cases (62, 2.4%) had clinically serious symptoms. The number of asymptomatic cases were significantly higher in females than in males (χ^2=264.84, P<0.001). Most of the intentional exposures (1351, 80.6%) were asymptomatic, just 19.4 % of them had clinical symptoms. A significant association was found between motivations for exposure and the clinical severity of clinical manifestations (χ^2=22.63, P<0.001).

The recommended treatment methods included activated charcoal (799, 24.5%), supportive care or observation (1456, 44.7%), gastric lavage (490, 15.0%), antidotes (73, 2.2%), skin decontamination (10, 0.3%), mechanical emesis (1, 0.03%) and others (266, 8.2%). No treatment modality was recommended in 5.0 % (164) of the cases. Decontamination methods (activated charcoal, gastric lavage, skin decontamination) were frequently recommended for patients exposed to toxic amounts of substances (1033, 56.4%) but less for patients exposing non-toxic amounts (131, 13.8%). Besides these, among the recommendations given by DPIC for non toxic exposures, observation of the patients was recommended significantly more

TABLE 7: Summary of medications involved in exposures by categories.**

Medications		No.	%
Nervous system	Analgesics	587	15.5
	Antidepressants	511	13.5
	Others	886	23.4
Musculo-skeletal system	Anti-inflammatory and antirheumatic products	373	9.9
	Muscle relaxants	95	2.5
	Others	2	0.1
Alimentary tract and metabolism	Drugs for functional gastrointestinal disorders	133	3.5
	Vitamins and minerals	116	3.1
	Others	159	4.2
Anti-infectives / antimicrobials		273	7.2
Respiratory system	Nasal preparations	130	3.4
	Cough and cold preparations	53	1.4
	Asthma therapies	41	1.1
Cardiovascular system	Antihypertensives	118	3.1
	Other cardiac therapy	46	1.2
Hematopoietic system	Antianemic preparations	80	2.1
	Others	14	0.4
Hormones and hormone antagonists		39	1.0
Others		127	3.4
Total		3783	100.0

**Percentages are based on the total number of medications (3783).

than gastrointestinal decontamination (c^2=356.43 P<0.001, Table 8).

In the series of 2007, there were two fatal cases (0.08% of all exposures), both of them were dueto unintentional poisonings. One of these cases was 3 years old girl who was stung by a scorpion. The other case was 35 years old female who was poisoned by carbon monoxide inhalation.

DISCUSSION

This study analyzed the cases exposed to poisons and medications who were reported to the Dokuz Eylul University Drug and Poison Information Center (DPIC) in 2007. In Turkey, the data used in previous studies on this subject have been usually obtained from the records of admitted patients in the emergency departments of the hospitals.[3-15] Although DPIC mainly serves to the Aegean region of Turkey, it also receives phone calls from every city in the country. Therefore, unlike many previous studies, the data were collected from several sources and was more likely to be representative of whole the country.

TABLE 8: Summary of recommended treatments by amount of exposure.***

	Amount of Exposure					
	Toxic		Nontoxic		Unknown	
Recommended treatments	No.	%	No.	%	No.	%
Decontamination methods (AC+GL+SD+E)	1033	56.4	131	13.8	136	28.4
Supportive care or observation	586	32.0	663	69.9	207	43.2
Other treatment	212	11.6	155	16.3	136	28.4
Total	1831	100.0	949	100.0	479	100.0

(AC: Activated charcoal, GL: Gastric lavage, SD: Skin decontamination, E: Mechanical emesis)
***More than one treatment might be recommended.

The vast majority of telephone calls (99.6%) to our DPIC were related to poison exposures, followed by the calls for receiving information about some drugs (0.4%). According to American Asso-

ciation of Poisen Control Center (AAPCC) report, informative calls about drugs was more frequent in United States (11.1%) when compared to our results.[17] In our report, the calls primarily come from health care facilities, poisoning incidents constituting 99.6% of all consultations. Moreover, most of the calls (99.1%) were made by physicians. Although residence was the most common site for poisoning incidents in our DPIC, the calls from health care facilities (97%) was much more common in our report when compared to that of poison centers in United States and Israel (15.6% and 0.8%, respectively).[17,18] The reason for ineffective use of our DPIC by public may be because of the various factors like close localization of the health care facilities to residence area and/or unawareness of DPIC by the public. Although our DPIC serves all Aegean region, most of the calls came from Izmir (73.3%).

Unlike some of the previous studies,[6,9,10] in our report, a seasonal trend was not found although slightly higher numbers of cases were reported in November and December. In our study, the most common route of exposure was ingestion (92.7%) similar to the findings of some other studies from Turkey.[5,9,10,19] Similar results have been reported in other countries .[17,18,20,21]

In a study by Bentur et al., in 57.1% of the cases, the time elapsed between exposures and the calls was less than two hours.[18] Similarly, elapsing time was found to be less than two hours in 51.0 % of the cases in our study. Shorter time periods were detected in children younger than six years (2.1 ± 4.6 h). We suggested that accidental exposures were recognized earlier by the parents of children aged less than 6 years unlike the intentional exposures in adults. The average number of calls per a day was 7, and most of the calls (54.7% of all cases) were made in evening which can be corresponding to the meeting of family members. Similar findings have already been reported in previous case series from Turkey.[19,22]

A female predominance was found among the cases of poison exposure in 2007. Many of the previous studies from Turkey also reported that females constituted the majority of poisoning cases.[6,8-10,12-14,19] Although the female-to-male ratio (2:1) in our study was in concordance with the previous studies from our country, this ratio was reported approximately 1:1 in other countries.[17,18,20,21] Most of the reported cases in DPIC were adults (54.5%). Similarly, in Iran, Afshari et al. reported that poisoning was more common in adults.[20] In contrast to these, majority of the poisoned patients was younger than 18 years in United States[17] and Israel.[18]

In our study, intention (suicide attempt, misuse or abuse) was the predominant motivation for the exposures, especially in females, in all age groups (65.5%) but not in 0-12 year-old children group. Similar results have been reported in a number of previous studies from Turkey and Iran.[6,9,10,14,19,20] However, there are divergent reports from other countries. In the 2007 report of AAPCC and in a study from Israel by Bentur et al., most of the poisoning exposures (83.2% and 74.4%, respectively) were unintentional in nature.[17,18] In a study from Vietnam, the rate of unintentional exposures were 49.3 %.[21] In our study, the rate of unintentional exposures was higher than intentional exposures in 0-12 year-old children. The predominance of intentional cases in Turkey may be explained by the fact that there were fewer calls coming from public regarding the unintentional exposures when compared to calls from health care facilities probably dealing with serious intentional poisoning cases.

Medications were the most frequent causes of poisoning and accounted for 72.5% of all cases. This finding is in concordance with the previous studies from Turkey and other countries.[4-12,14,15,17,18,20] Chemicals, metals, cosmetics (4.7%) and alcohol (4.7%) were also common causes of exposures, followed by pesticides/rodenticides/herbicides (4.4%), cleaning products (4.4%) and mushroom, plants, food (2.5%). In a previous report from our DPIC, the rate of pesticide exposure was higher than the recent findings (8.8%).[23] This ratio might have been decreased in recent years due to the restriction brought on some pesticides by the Ministry of Agriculture and Rural Affairs. However, in some recent studies from Turkey, still, the rate of pesticide

poisoning (between 18.9-34.7%) was higher than this report.[8-10,14] The aforementioned studies were performed in the hospitals generally located in the southern and the south-eastern regions of Turkey. These regions have vast rural and agricultural areas. In studies by Satar et al.[9] and Seydaoglu et al.,[10] high rate of pesticide poisoning was explained by the socioeconomic status in these regions and rather easy access to these poisonous substances. Therefore, it was suggested that, the type of substances responsible for poisonings may differ from one region to another in Turkey.

Analgesics were found to be the most common agents in DPIC records, similar to annual AAPCC report in 2007.[17] In particular, paracetamol was the most frequently ingested drug among all other medications, similar to results of different countries.[5,19] The high incidence of paracetamol exposures may be due to extensive availability of this over-the-counter medication. In the following report, it was found that antidepressants, especially amitriptyline, were the second leading cause of medication-related poisonings. Contrary to this finding, in the studies from different countries, antidepressants were reported to be the 3rd to 12th cause of poisonings with drugs.[17,18,20] The higher rate of amitriptyline related poisonings in this report may be due to the fact that these medications are widely available and inexpensive as well as being easily obtained from pharmacies without prescription.

Majority of the poisonings cases (77.9%) had no symptoms at all, similar to the findings of other studies from Turkey.[19,22] However minor and moderate symptoms are reported in 16.3% (417) and 3.3% (84) of the cases, respectively; whereas only a minority of the cases (62, 2.4%) had clinically serious symptoms. Similarly, in a study from Israel,[18] 50.4% of cases were without any complaints, while 30.9% of them had minor, 2.8% had moderate and 0.7% had major symptoms. In that report, mortality rate was 0.03%. In our report, the number of asymptomatic exposures in female patients was found to be significantly higher than that of males. Based on this results, it can be speculated that female patients would have been exposed to less toxic substances or the amount of the toxic substance was less in these patients when compared to the male patients when in case of intentional poisonings.

In a study by Ozkose et al., it was reported that 69.3% of the cases received activated charcoal. Besides this, gastric lavage was performed in 57.0% of the cases and 5.3% of the cases had specific antidotes.[4] In another study from Turkey by Satar et al., 68.1% of the patients did not receive any treatment at all. Although gastric lavage was performed in 24.6% of patients, 4.8 % received antidotes and 2.5% used activated charcoal.[9] The AAPCC reported that decontamination procedures were provided in 44.7% of their cases.[17] In our report, similar to AAPCC's findings, decontamination procedures were recommended to almost 40% of the cases [(activated charcoal (24.5%), gastric lavage (15.0%), skin decontamination (0.3%), and mechanical emesis (0.03%)]. No treatment methods were recommended in 5.0 % of the cases. Moreover, non-toxic exposures constituted 34.5% of all exposures. Our findings demonstrate that supportive care or observation was recommended in a high percentage of patients with non-toxic exposures (69.9%). The gastrointestinal decontamination procedures were recommended by DPIC in 13.8% of non-toxic exposures. Gastrointestinal decontaminations were recommended more frequently toxic exposures when compared to those for non-toxic exposures. Therefore, DPIC have played an important role for selection of patients for gastrointestinal decontamination procedures following poisoning events, and prevented unnecessary gastrointestinal decontaminations.

In this report, there were two mortalities (0.08%); one of these patients was an adult who died of carbon monoxide inhalation, where as the other case was a child exposed to a scorpion sting. In a study from AAPCC, mortality rate was reported as 0.05% of all cases. Our mortality rate may be lower than the real mortality rate because of the fact that DPIC receives intentional, not obligatory mortality reports and there are limitations for telephone follow ups regarding mortalities.

CONCLUSION

The medications, especially, analgesics and antidepressants were found to be the main causes of poisonings in 2007 DPIC report. Although analgesics and antidepressants are not over the counter medications in Turkey, they can easily be obtained even without prescription, so these can be responsible from high rates of poisonings. There is a need for a central poisoning data system in order to make extensive studies to determine preventive measures and regulations related to poisoning incidents in Turkey. Detailed research can be accomplished in this field with the assistance of national poisoning database system which compiles the information gained from all poison information centers across the country.

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