

ORIGINAL ARTICLE

Annual Report of Recorded Phone Calls to Iran's Drug and Poison Information Centers (2014-2015)

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Abstract

Background: The annual statistics of Drug and Poison Information Centers (DPICs) have critical role in public health planning. The objective of this study was to provide annual epidemiologic profile of drug inquiry and poisoning-related phone calls to Iran's DPICs during 2014-2015.

Methods: This was a descriptive retrospective study by reviewing reported phone calls of Iranian DPICs to central division in Tehran (NDPIC) during one Iranian solar year (1393 A.H. equivalent to March 20th 2014 to 20th March 2015 A.D).

Results: During the study period, 250368 phone calls were registered in 36 DPICs across the country. The majority of callers were women (145917, 58.28%). The most frequent calls were made by the individuals in the age group of 31 to 40 years (48795, 19.49%). Most of the calls were made by the patients (134322, 53.64%) followed by patients' relatives (105646, 42.2%). The most common subject of calls was adverse drug reactions (42682, 19.4%), followed by therapeutic use (37114, 16.9%) and drug administration (30091, 13.7%) inquiries. Micromedex (54324, 21.70%) was the most commonly used reference to answer the inquiries. Given that 223482 calls were related to drug information inquiries, the most common drugs questioned about were antibiotics (24274, 10.86%); whereas 4548 calls were made about poisonings and the majority of them were due to pharmaceutical agents (2556, 56.20%).

Conclusion: Iranian people seems to have numerous unmet drug information needs. This may especially be the case for antibiotics, nutrients and anti-depressants. Pharmaceutical products are the main subjects of poisoning-related calls to DPICs in Iran. Public education on usage, safety and storage of drugs as well as strict terms of sale should be implemented.

Keywords: Drug Information Services; Epidemiology; Pharmacovigilance; Poison Control Centers; Iran

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INTRODUCTION

Drug and Poison Information Centers (DPICs) are healthcare associated units established with professionally trained team engaged in providing accurate and factual information about drugs and poisons (1,2). The first DPIC in Iran was established in 1997 in Tehran, as a part of Iran's Food and Drug Organization (FDO), supervised by the Iranian Ministry of Health and Medical Education (MHME), also known as the central or national DPIC (NDPIC) (3). Since then, 35 other DPICs have been established in the major cities of Iran until 2014, under the supervision of regional medical universities and the MHME (4).

The services provided by DPICs can help detection and prevention of adverse drug reactions (ADRs), medication errors and promotion of rational use of drugs. In addition, DPICs have a clear role in significant reduction in medical charges by preventing drug misuse as well as detecting the presence of drug toxicities and offering clinical advice in case of poisonings (2,5). Therefore, these centers can positively improve the treatment outcomes and efficiently reduce countrywide healthcare costs (6,7).

The annual statistics of DPICs have critical role in public

health planning for improved management of common health issues such as misuse, abuse, or irrational use of drugs, and poisoning events. The objective of this study was to provide annual epidemiologic profile of drug inquiry and poisoning-related phone calls to Iran's DPICs during 2014-2015.

METHODS

This was a descriptive retrospective study by reviewing reported phone calls of Iranian DPICs to central division in Tehran (NDPIC) during one Iranian solar year (1393 A.H. equivalent to March 20th 2014 to 20th March 2015 A.D). Each DPIC across the country is responsible to provide periodic reports to NDPIC in Tehran. These reports contain demographic features of the callers, reasons for calls, drug or toxic agent questioned about and the medical resources used for answering the inquiries.

Based on the study objectives, the reports from all 36 DPICs were reviewed and their data were entered into a structured checklist. The main variables of the study included identity, gender and age of the callers, type of inquiries (e.g. drug identification, therapeutic use of drugs, adverse drug reactions, drug interactions, poisoning-related calls, etc.), type of drugs questioned about, type of poisons used in

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poisonings and medical references used to answer inquiries. Received calls to DPICs were managed by healthcare professionals working under the supervision of a clinical pharmacist or toxicologist. The collected data were entered into a database and analyzed using Microsoft Excel (Microsoft Corp., Redmond, WA, USA).

Table 1. Distribution of number of calls to Iranian DPICs according to the city of origin (n = 250368)

City	N (%)
NDPIC*	89876 (35.90)
Tehran	41562 (16.60)
Total	131438 (52.5)
Esfahan	52794 (21.09)
Shiraz	23149 (9.24)
Mashhad	7909 (3.15)
Ahvaz	5377 (2.15)
Kerman	4524 (1.8)
Birjand	3424 (1.37)
Karaj	3223 (1.29)
Zanjan	2211 (0.88)
Tabriz	2021 (0.81)
Ardebil	1639 (0.65)
Kermanshah	1320 (0.53)
Shahr e Kord	1298 (0.52)
Sabzevar	1123 (0.45)
Hamedan	1043 (0.42)
Sari	983 (0.40)
Qom	910 (0.36)
Bushehr	876 (0.35)
Qazvin	870 (0.34)
Yazd	826 (0.33)
Rafsanjan	480 (0.19)
Jahrom	474 (0.19)
Zabol	450 (0.18)
Gorgan	346 (0.14)
Torbat Heydarieh	318 (0.13)
Rasht	271 (0.11)
Yasouj	242 (0.10)
Arak	219 (0.09)
Babol	155 (0.06)
Sanandaj	150 (0.06)
Zahedan	100 (0.04)
Semnan	69 (0.03)
Urmia	58 (0.02)
Kashan	54 (0.02)
Fasa	24 (0.01)

* NDPIC: National Drug and Poison Information Center

RESULTS

General profile of calls

During the study period, 250368 phone calls were registered in Iranian DPICs across the country. The highest number of calls was made to Tehran-based DPICs (131438, 52.5%) followed by Esfahan DPIC (52794, 21.09%) and Shiraz DPIC (23149, 9.24%) (Table 1). The peak time of phone calls was at 12-14 PM (73193, 29.23%) followed by 10-12 AM (49595, 19.81%) and 16-19 PM (35774, 14.29%).

Characteristics of callers

The majority of callers were women (145917, 58.28%). The most frequent calls were made by the individuals in the age group of 31 to 40 years (48795, 19.49%) followed by 19 to 30 years (45534, 18.19%) and 41 to 60 years (40844, 16.31%) (Table 2). Most of the calls were made by patients (134322, 53.64%) followed by patients' relatives (105646, 42.2%).

Table 2. Characteristics of callers, type of inquiries and references used to answer to the inquiries (n = 250368)

Variables	N (%)
Gender of callers	
Female	145917 (58.28)
Male	104451 (41.72)
Age of callers	
< 2	22646 (9.05)
2-12	23164 (9.25)
13-18	11835 (4.73)
19-30	45534 (18.19)
31-40	48795 (19.49)
41-60	40844 (16.31)
> 60	18878 (7.54)
Unregistered	38672 (15.44)
Identity of callers	
Patient	134322 (53.64)
Patient's relatives	105646 (42.20)
Pharmacist	3595 (1.44)
General physician	2113 (0.84)
Other healthcare professionals	1934 (0.77)
Specialists	469 (0.19)
Other	2307 (0.92)
Type of inquiries	
Adverse drug reactions	42682 (17.05)
Therapeutic use*	37114 (14.82)
Drug administration	30091 (12.02)
Other types of drug interactions**	19582 (7.82)
Pregnancy & lactation	17579 (7.02)
Drug dosage	15968 (6.38)
Drug substitution	14573 (5.82)
Drug-drug interactions	13788 (5.51)
Storage & stability	12918 (5.16)

Table 2. Continued.

Variables	N (%)
Drug identification	11572 (4.62)
Poisoning	4548 (1.82)
Uncategorized	22356 (8.93)
Other	7597 (3.03)
References used to answer inquiries	
Micromedex	54324 (21.70)
Poisindex	31918 (12.75)
Internet	24532 (9.80)
Martindale	17248 (6.89)
Drug in Pregnancy & Lactation	11691 (4.67)
AHFS drug information	10750 (4.29)
Drug Facts	9645 (3.85)
Physician Desk References	8171 (3.26)
Iran Pharma	6878 (2.75)
Unreported	75211 (30.04)

*Indications, efficacy, etc.

**Drug interactions with other substances (e.g. food-drug interactions)

Type of inquiries

Distribution of calls to Iran's DPICs according to the type of inquiries illustrates that the contacts mainly concerned ADRs (42682, 19.4%), therapeutic use (37114, 16.9%) and drug administration (30091, 13.7%) inquiries (Table 2). Micromedex (54324, 21.70%), Poisindex (31918, 12.85%) and internet (24532, 9.80%) were the most commonly used references to answer the inquiries.

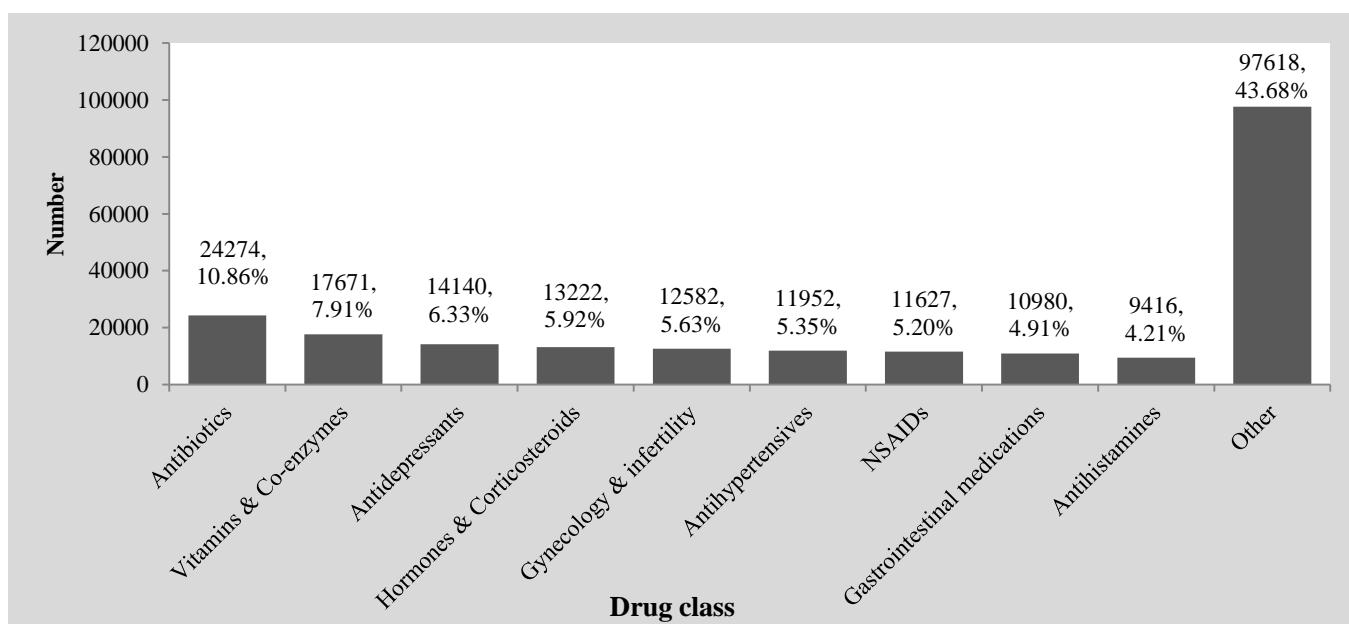
Details of drug and poisoning related inquiries

Given that 223482 calls were related to drug information inquiries, the most common drugs questioned about were antibiotics (24274, 10.86%), vitamins and co-enzymes (17671, 7.91%) and antidepressants (14140, 6.33%), respectively (Figure 1).

Considering that 4548 calls were made about poisonings, the majority were due to pharmaceutical agents (2556, 56.20%), followed by opioids (694, 15.26%) and contaminated foods (644, 14.16%) (Figure 2).

DISCUSSION

In total, 250368 calls were registered in Iran's DPICs in 2014-2015 which shows approximately an average of 6.5% increase in number of calls compared with previous report from Iran in the years 2011 and 2012 (4). This increase can be due to both addition in number of Iranian DPICs (establishment of two new DPICs in recent years) and increased public awareness of services provided by DPICs. In addition, even though in the first years of launch of NDPI in Iran, physicians and pharmacists were the most frequent callers (8), in the present study, the highest rate of calls belonged to patients and patients' relatives. This further confirms the fact that Iranian people has become more familiar with DPICs and their services in recent years. However, considering the country population, the number of calls seems to be low. Hence, more informing programs around the country are required especially in major cities to build public awareness about the utility and importance of services provided by DPICs. DPICs should be introduced to Iranian people more, so that these settings can improve the performance of the national healthcare system. Furthermore, similar to Pakistan; a need for structured training programs in Iran still exists on both clinical and environmental

**Figure 1.** Frequency distribution (n, %) of drug inquiry calls to Iran's DPICs according to drug class, 2014-15 (n = 223482)

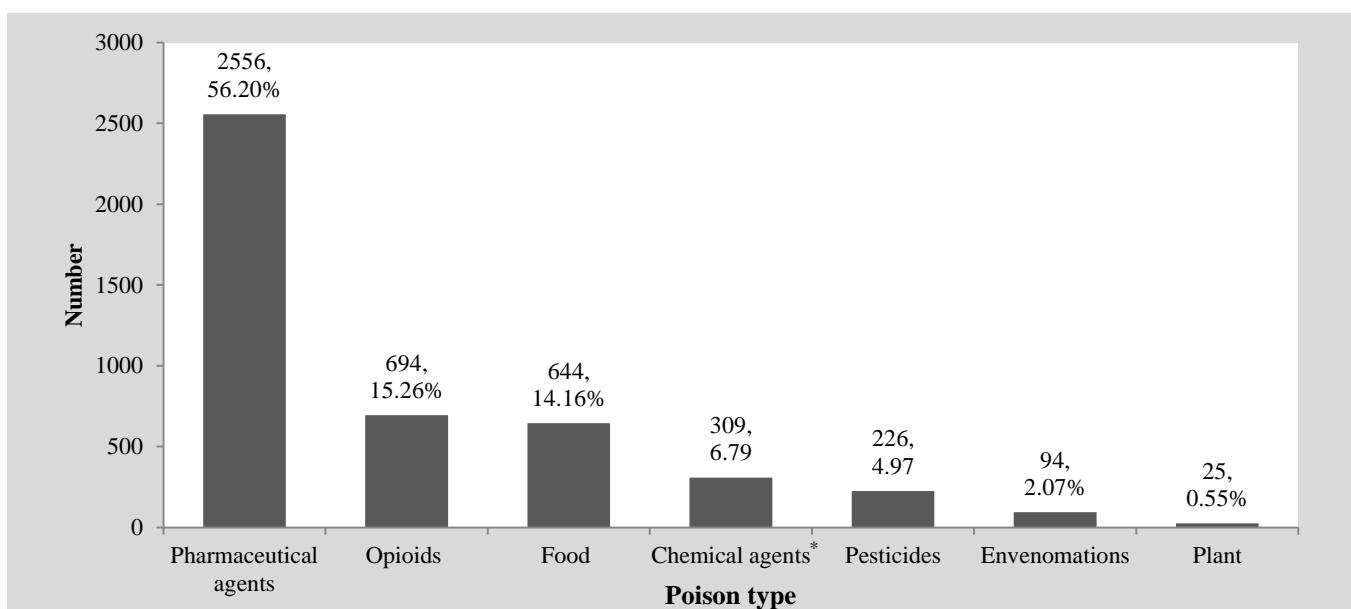


Figure 2. Frequency distribution (n, %) of poisoning-related calls to Iran's DPICs according to poisoning agents, 2014-15 (n = 4548)

* Chemical agents: Environmental, industrial or household chemicals other than pesticides

toxicology levels to strengthen the poison control centers (PCCs) as well as the quality care of patients (9). Studies have shown that structured courses and training improve knowledge of the healthcare providers and efficiency of care delivered to poisoned patients (9).

In the present study, the majority of callers aged between 31 to 40 years that is consistent with previous Iranian reports (4,10,11). Higher rates of inquiries about ADRs and therapeutic use of drugs in this study, which is in agreement with other Iranian reports (8,10,11), shows that the majority of Iranian patients might not receive adequate information about their prescriptions from physicians and pharmacists or perhaps they did not comply completely with their physician's orders.

Since the antibiotics are the most common prescribed medications in Iran (12,13), it is not surprising that the most common drug inquiries in the present study were about this class of drugs. Moreover, self-medication that is common among people in developing countries can be considered as another reason for higher rate of antibiotics use and subsequent inquiries to DPICs (14).

According to our findings, pharmaceutical products and opioids were the main causes of poisonings in Iran in 2014-15. This somehow replicates our previous report from 2011 and 2012 (4). However, food poisonings that ranked fourth among the causes of poisoning-related calls in 2011-12 (4), are now the 3rd common causes of poisoning-related calls, a fact that there is currently no clear explanation for it and requires more attention by health authorities. Different reports of poisoning status in Iran display that principal causes of poisonings are different classes of drugs followed by industrial chemical agents especially pesticides (15-17). Nonetheless, in Morocco, scorpion stings were the most common reasons behind calls to the central Moroccan PCC

followed by pharmaceuticals, food and carbon monoxide during 1980 to 2011 (18). Pesticides, household products, and pharmaceutical products were reported as the most common poisons involved in human exposures in Thailand, between 2001 and 2004 (19). Plant intoxications that represented 0.55% of poisoning-related calls in the present study, were 5 times higher (2.79%) among human exposures reported to the United States National Poison Data System (20,21).

Presentation and analysis of seasonal and annual reports of drug and poisoning inquiries to DPICs/PCCs are among the best sources for planning and statesmanship of medical and pharmaceutical distribution system in each country. DPICs have pivotal role in improving public health and poisoning prevention (22). Proper registration of drug/poisoning inquiry calls according to international guidelines, ADR reporting, formulation of poisoning management guidelines, organizing workshops to train new experts and informing courses for public should be considered as the most important activities of DPICs. With the emergence of mobile technology, internet-based communication and social media, DPICs should utilize these platforms for more extensively dissemination of drug and poison information and warnings for public. In addition, these technologies can facilitate bringing critical poison information to the bedside clinicians (23).

LIMITATIONS

Given that most DPICs in Iran are newly established, their call documentation database and registry and the staff working with them are still at the early steps. Therefore, some centers only sent raw data to NDPIC in Tehran. Moreover, some phone call records were incompletely filled out.

Although drug poisonings were the most common cause of poisonings, details of the drugs responsible for this type of

poisonings were not registered in the phone call records. Hence, we were not able to determine which group of medications were used for poisonings. Moreover, most poisoned cases were not followed and their outcomes (hospital admission, complications, recovery or death) were not available. Besides, satisfaction level of callers with the services provided by DPICs was not assessed. In this respect, Entezari-Maleki et al recommended developing a feedback system for callers enabling them to give their opinions about the quality of services provided by DPICs at the end of the calls (11).

CONCLUSION

Iranian people seems to have numerous unmet drug information needs. This may especially be the case for antibiotics, nutrients and anti-depressants. Pharmaceutical products are the main subjects of poisoning related calls to DPICs in Iran. Public education on usage, safety and storage of drugs as well as strict terms of sale should be implemented. Prescription of drugs for short intervals and careful monitoring of patients are also helpful for decreasing drug poisonings.

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