

## Poison Control and the Drug Information Center: The Palestinian Experience

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**Key words:** poison control, drug information, prevention, toxicology, Palestine

### Abstract

**Background:** The Palestinian Poison Control and Drug Information Center was established in 2006 to provide up-to-date information on medications and to help in the early diagnosis and management of poisoning cases.

**Objectives:** To summarize the activities carried out by the PCDIC in the past 2 years.

**Methods:** Documented inquiries received at the PCDIC were analyzed and the Center's activities were extracted from the files.

**Results:** During the first 2 years of the Center's existence, 323 enquiries were received, mainly (67.2%) from physicians; 70% of the calls were from the city of Nablus. Unintentional poisoning was the leading type of call (62.8%) followed by suicidal poisoning (20.7%). Medications were the major category of toxicants encountered (48.9%), followed by pesticides (23.5%). In 67.9% of the cases, the calls were initiated before any treatment was provided. The advice provided by the PCDIC was based on the nature of the call. During these 2 years the PCDIC has conducted both academic and non-academic activities. The Center introduced the concept of poison prevention weeks in Palestine and has conducted two so far. The PCDIC has published several articles in the fields of toxicology, rational drug use, complementary and herbal therapy, pharmacoepidemiology, and self-medication.

**Conclusions:** Documentation of all enquiries is mandatory for analysis, evaluation, comparative purposes and quality assurance. More information campaigns are needed to encourage people to use the services provided by the PCDIC.

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It has become increasingly difficult to memorize and remember the adverse effects of the new chemicals that are constantly being introduced into our world. Similarly, the number of medications approved for clinical use is continuously growing, resulting in an extra burden for the health care providers in determining their dosages, uses and other medication-related issues. For these reasons and others, poison control and drug information centers were established with the primary goal of providing information to those in urgent need of such information [1,2]. In Palestine, the only such facility, the Poison Control and Drug Information Center, was established at An-Najah National University in 2006. Before the establishment of the PCDIC, poisoning cases were treated empirically or the Israel Poison Information Center at the Rampam Health Care Campus, Haifa, Israel was consulted. The PCDIC is equipped with several resources to answer enquiries;

these include Micromedex databases, textbooks, internet sites and periodicals. The PCDIC staff also works with a team of consultants, namely, pediatricians, internists, pharmacists, plant specialists, and nurses. The PCDIC provides information via phone, email, fax, or regular mail. The Center provides information and advice on medications and poisoning 24 hours a day 7 days a week. The Center can be visited through its website: [http://www2.najah.edu/nnu\\_portal/index.php?page=86](http://www2.najah.edu/nnu_portal/index.php?page=86). The PCDIC is currently in the process of getting registered as a recognized center on the website of the World Health Organization/International Program of Chemical Safety. The PCDIC will be affiliated with the An-Najah National University medical teaching hospital and with the forensic and toxicology laboratory within the next 2 years. The aim of this article was to summarize the activities carried out by the PCDIC in the 2 years since its inception.

### Methods

Data for this article were extracted from the PCDIC archives. These data include phone calls, academic and non-academic activities, and research projects. All inquiries received in the past 2 years were analyzed. A pre-designed form was used to obtain information pertaining to every received call. The form includes questions related to the caller's identity, date and time, patient demographics, type of inquiry, the chemical or medication of interest, signs and symptoms, and the first aid or treatment provided before calling. A special section of the form was designed to include the advice provided by the PCDIC staff. All the data from the forms were entered and statistically analyzed. In cases of poisoning, the staff would seek information indicating the type of poisoning in order to classify it as unintentional or suicidal. All data were entered, statistically analyzed, and graphed using SPSS 15.

Academic and non-academic activities carried out by the PCDIC in the past 2 years were summarized. Particular emphasis was placed on training and case discussion sessions provided for health professionals and those in the Palestinian National Authority ministries. Regarding the Center's research activities, an internet search was conducted to list all publications of the PCDIC staff.

### Results

In the past 2 years the PCDIC has carried out four different types of activities: a) providing information, advice, and serving as a guide for patient management; b) teaching and training students

PCDIC = Poison Control and Drug Information Center

and health professionals in the field of poisoning and drug information; c) raising community awareness regarding poisoning and drug safety; and d) conducting research in the field of pharmacoepidemiology, drug safety and poisoning.

**Provision of information, advice, and guiding patient management**

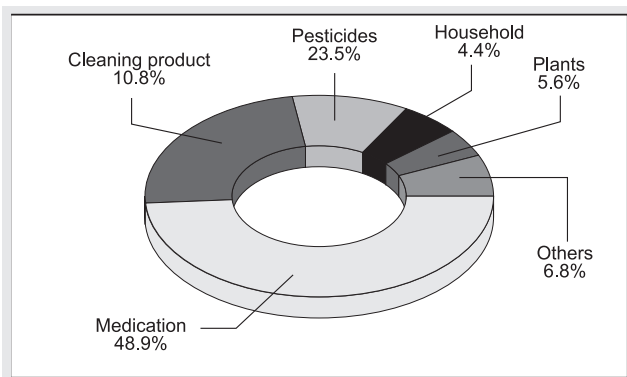
Analysis of the calls received by the PCDIC during the past 2 years revealed that 323 calls were made – 152 in the first year and 171 in the second. All callers were answered on the same day that they called, and most received their answer during the initial call. Very few were answered within the next hour. The calls were made by physicians (67.2%), pharmacists (4%), and the general public (28.5%). Calls were made from different places in Palestine, but most (70.3%) came from the Nablus district.

The received calls were analyzed to determine their nature. Analysis revealed that unintentional poisoning was the leading reason for calls (62.8%), followed by suicidal poisoning (20.7%), general information (10.8%), adverse reactions, and drug information (5.5%) [Table 1]. Analysis of the gender of the poison victims showed that 68.3% were males and 31.4% females. The majority of victims (54.0%) were under the age of 6 years, while 5.9% were 6–18 years old, and 40.1% were above the age of 6. Drug information questions enquired about therapeutic uses, side effects, drug interactions, doses, and a few on the teratogenic potential of medications. It was found that medications comprise the majority of toxicants encountered (48.9%), followed by pesticides (23.5%), cleaning products (10.8%), and plants (5.6%) [Figure 1]. Fortunately, most of the patients were asymptomatic (44.1%). Gastrointestinal complaints (vomiting, nausea, abdominal pain, diarrhea) were the second most common complaint by the patients, followed by cholinergic system effects [Table 2].

The actions taken before calling the PCDIC were all recorded.

**Table 1.** Nature of enquiries

Type of inquiry	No. (%)
Unintentional poisoning	203 (62.8)
Suicidal poisoning	67 (20.7)
General information	35 (10.8)
Adverse effects	15 (4.6)
Drug information	3 (0.9)



**Figure 1.** Materials encountered in poisoning cases

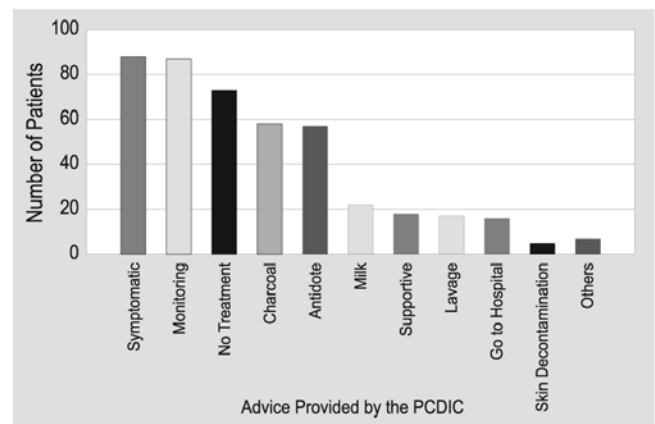
**Table 2.** Major complaints of poison victims

Complaint	Number	Percentage
Asymptomatic	197	44.1
Vomiting	41	9.2
Nausea	26	5.8
Abdominal pain	27	6.0
Cholinergic effects	39	8.7
Respiratory depression	15	3.4
Diarrhea	12	2.7
Allergy	8	1.8
Headache	7	1.6
Dryness	7	1.6
Drowsiness	13	2.9
Erythema	8	1.8
Bronchospasm	5	1.1
Coma	7	1.6
Burning	6	1.3
Irritation	5	1.1
Hypotension	3	0.7
Others	21	4.7

Analysis showed that in most cases (67.9%) nothing had been done. Gastric lavage was performed in 23.6% of the cases, while activated charcoal was given in only 1.5% of cases. After calling the PCDIC, the advice received ranged from administering activated charcoal to giving an antidote. Supportive and symptomatic treatment was recommended in most cases (18.7%), followed by advice to monitor the patients (18.5%); no treatment was needed in 15.7% of the cases; activated charcoal administration (12.7%) and the advice to administer an antidote was given to 12.3% of the callers [Figure 2].

**Teaching and Training**

During the past 2 years, the PCDIC has carried out a series of professional workshops with the Ministry of Health, Ministry of National Trade, Ministry of Education, and Ministry of Agriculture. The aims of these workshops were, for example: to introduce the



**Figure 2.** Advice provided by the PCDIC to health care providers and the general public

national poison registry form, improve product labeling (including the toll-free number of the PCDIC on Palestinian products), as well as institute the rational use of medications, proper use of pesticides, and the substitution of toxic materials with less toxic ones whenever possible.

With respect to teaching and education, the PCDIC also offers a course to all non-medical students at An-Najah National University on toxic materials and how to prevent poisoning. In addition, toxicology case-study sessions are continuously held at the PCDIC for senior pharmacy students. The graduate students at the College of Pharmacy, supervised by the PCDIC, prepared and gave lectures to physicians at the hospitals on the latest treatment strategies for commonly encountered poisons.

### **Raising community awareness**

The PCDIC plays a key role in the public's awareness with regard to preventive measures. The Center cooperates with non-medical organizations such as the Ministry of Education in raising awareness among school students. This was achieved by organizing two poison prevention weeks in the past 2 years, and the Center is currently preparing to launch the third. The PCDIC carries the responsibility to inform the general public about the potential hazardous materials around them, their risks, and the safe use and storage of such chemicals at home and at work. Poison prevention weeks have become an annual activity run by the Center. During this week, two major activities are held. The first is an exhibition about poisons in our environment and how to protect ourselves from them. Visitors to this exhibition are school students and the general public. Second, lectures are given at the local schools on toxins, their danger and how to avoid them, and about the role of the PCDIC. Feedback reports about such activities are supportive and encouraging.

### **Research**

An important goal of the PCDIC is to conduct research to evaluate the current status of medications and poisons in Palestine. Since its official opening the PCDIC has published several articles, focusing on rational drug use, management of hazardous and poisonous substances, self-medication and risk of poisoning, and the toxic implications of herbal and other complementary and alternative medicine practices. These research projects have led to many useful publications that will shape the future of health practice in Palestine. For example, a published study conducted to evaluate antidote stocking at hospitals in northern Palestine indicated that most of the hospitals in Palestine were not well equipped to receive and properly treat poisoning cases and that none of the surveyed hospitals had the complete stock of antidotes [3]. A study regarding the storage and utilization of hazardous and dangerous cleaning products at home showed that bleach and acidic cleaners were not stored safely in most cases and led to adverse effects in people [4]. Others addressed the issue of complementary and alternative medicine [5]. Several publications from the PCDIC addressed the issue of rational drug use [6,7]. Another study on self-medication practices found that many Palestinians consume medicinal plants

whose safety might be questionable. A study investigating the utilization of medications during pregnancy found that pregnant women take both over-the-counter and prescription medications during pregnancy, especially analgesics and antibiotics, respectively. Most medications matched the U.S. Food and Drug Administration categories B and C, but some were from FDA category D [8]. A study on medication dosing errors found that for many hospitalized patients the doses of several medications were inappropriately adjusted based on renal function [9]. Two studies evaluated antibiotic consumption, one in the pediatric ward, while the other measured the consumption in defined daily doses [10,11]. Another study investigated the impact of admission blood glucose on the outcome of acute myocardial infarction [12]. Finally, a study on warfarin use among patients with atrial fibrillation concluded that most physicians do not prescribe anticoagulants for such patients despite the fact that there was no risk or contraindication for warfarin use [13].

### **Discussion**

Even though the PCDIC is only 2 years old, many of its initial goals have been achieved and work is ongoing to fulfill the others. Utilization of the services provided by the PCDIC appears to be the highest in the Nablus district. Lower utilization in other places may indicate lack of knowledge of the PCDIC and its activities. There is a need to encourage more callers to utilize the available services which can be done through an information campaign in remote areas in Palestine. The PCDIC has a toll-free number to encourage callers, yet the number of calls received daily by the Center is much less than that received by the Israel Poison Information Center or by any poison center in the United States. This might be due to the fact that these centers were established much earlier than the PCDIC.

The PCDIC was created mainly to provide unbiased up-to-date information to health care providers for managing cases of poisoning. This objective has been achieved among physicians since they constitute the majority of callers. It seems that physicians utilizing the PCDIC services may lack confidence or adequate knowledge in clinical toxicology since they call immediately after a case of poisoning is admitted or suspected. It is not possible to evaluate the outcome of this service since not all the cases were followed; and even when follow-up was conducted it lasted for only a few days after the poisoning incident. The time that elapsed between poisoning and calling the PCDIC was not recorded, but analysis of such a factor is not possible at the present time; analytical toxicology testing is not yet performed at the PCDIC. Some poison centers function mainly as information providers such as in the USA; others perform testing such as the IPIC and those in Saudi Arabia. The PCDIC is currently working with the Forensic Medicine Institute to include forensic toxicology among its services. To identify the level of chemicals in the body one needs different

FDA = Food and Drug Administration  
IPIC = Israel Poison Information Center

analytical instruments that are currently unavailable due to budget limitations.

Medications constitute the major causative agents of poisoning cases, followed by pesticides. This might be due to the availability of many medications over the counter, lenient pharmacy laws, and to the tendency to consume medications in Palestine. Children like to mimic adults and they might take medications primarily for that reason. As for pesticides, many people work in agriculture and most of them store pesticides at the farm or in their homes, which makes them accessible to others.

Based on our professional evaluation of management performed before calling the PCDIC, it is obvious that many physicians mismanage poisoning cases by performing unnecessary gastric lavage or inducing vomiting, and administering activated charcoal in much smaller doses than required, when indicated. This may put the poisoned patients at increased risk, and it indicates the need for continuous medical education in the field of management of poisoning cases. Knowledge of the ABC's of poisoning, of decontamination methods and when to use each one, and of patient stabilization are highly advisable for all physicians. The PCDIC can organize training courses for interested professionals on this issue.

The decision to conduct poison prevention weeks was based on the fact that most cases reported to the PCDIC were unintentional poisoning. Increasing awareness about poisoning prevention is the major goal of this project, and to date two have been organized in cooperation with the Ministry of Education and the College of Pharmacy. Such weeks aim to decrease the possibility of unintentional exposure to toxicants and to educate people on the proper steps in cases of poisoning. In the USA, a similar program is run by the Poison Prevention Week Council (<http://www.poisonprevention.org>); most centers participate in such an activity using different methods such as distributing brochures and giving classes to children on how to avoid poisoning. An Internet search did not reveal any such activity conducted by poison centers in neighboring Arab countries.

The aim of research conducted by the PCDIC was to create a database on which to rely for future decisions; this research has been published in reputable journals [3-13]. Copies of these studies were sent to the interested ministries and institutions with the hope of inducing a positive change in current practice and future plans. More research is currently underway on topics that are important for human health. Analysis of the publications from neighboring Arab countries revealed very few research articles from their centers.

The present study emphasizes the importance of proper documentation of all activities and enquiries of the PCDIC for quality improvement, research and assessment. Most data collected by poison centers in developing countries are those reported to them [4]; however, more effort is needed to collect data per-

taining to poisoning on a national basis. Additionally, adopting a uniform method of data collection will enable comparative studies between such countries in the future.

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