Assessment of drug and poison information centers in Saudi Arabia

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ABSTRACT

Background: Drug Information Centers (DICs) and Drug and Poison Information Centers (DPICs) in Saudi Arabia are pharmacy-based departments that provide drug information services for prescribers and or public. We sought to evaluate their current role in handling poisoning cases.

Methods: We conducted a cross-sectional survey of all DICs and DPICs in Riyadh and included 17 potential respondent centers. We developed a brief questionnaire with nine questions about DICs and DPICs resources.

Results: The response rate was 82%. Most responding centers provide service only during daytime hours. Three provide services on weekends, and five have staff on-call after business hours. Handling poisoning cases is not available in five centers and found to be minimal among all other centers.

Conclusion: DICs and DPICs provide limited poison information services in Saudi Arabia. In accord with the current Vision 2030 reform effort, establishing comprehensive poison control center services is a necessity for the healthcare system in the Kingdom of Saudi Arabia.

KEYWORDS
Drug Information Center; Drug and Poison Information Center; poison control center; survey

Introduction

Drug Information Centers (DICs) and Drug and Poison Information Centers (DPICs) in Saudi Arabia are pharmacy-based departments that function within their own institutions, mainly hospitals, and provide drug information services for prescribers and or public. In addition to that, DICs and DPICs may have a role in, but not limited to, drugs evaluation (formulary and non-formulary), off-label use of medications, education and training, research, quality improvement of drug usage to improve safety and cost effectiveness, and adverse drug reactions monitoring.

The basis of DICs and DPICs is the provision of independent drug information [1]. The World Health Organization (WHO) refers to the DICs as tools to disseminate unbiased drug information and thereby promote the rational use of drugs [1, 2]. While it seems that DICs and DPICs in Saudi Arabia are well established within their institutions to serve the main purpose of their existence, their role in handling poisoning cases and toxicological aspects of drugs and toxins is not clear. We believe that medical and clinical toxicology as a field of practice is underserved within the Kingdom’s huge healthcare system and lack the presence of well-structured and functioning poison control centers.

The WHO directory of poison centers, as of 30 September 2017 [3], lists 5 centers in the Kingdom (4 in the capital Riyadh city and 1 in Dammam city) of which are actually DPICs. The role of the WHO listed poison centers and the standards of their practice are not within the scope of this study but the extreme lack of medical toxicology support and services in Saudi Arabia is noticeable and in fact, questioning their role in providing such an important health care service. We sought to evaluate the current role of DICs and DPICs in handling poisoning cases in the Kingdom of Saudi Arabia with the aim to establish an understanding of the available resources that can potentially be utilized in the future to promote medical and clinical toxicology services.
Methods

Study design and sampling frame

We conducted a cross-sectional survey-based study of all DICs and DPICs in Riyadh, the capital city of the Kingdom of Saudi Arabia during the period between February and June 2018. We included and anticipated 17 potential respondent centers.

Questionnaire design

We developed a multi-item questionnaire with an open-ended question format. The questions (Table 1) were relevant to the study objectives and expected to be answered reliably in a survey-based study design. We introduced our study and tested survey questions for clearness, feasibility, and reliability by telephone with potential respondent centers.

Survey administration and data collection

We sent the survey questionnaire via e-mail to all 17 centers with up to three follow up contacts. Responses received were manually entered in a pre-designed data collection sheet which captured the following data: name of the center, the year of establishment, contact phone number, working hours, defined roles, number of employed staff and their qualifications, availability of services to health care providers and to the public, resources and databases utilized, and an average estimate of number of poisoning cases served per month, if any.

The enrollment in the survey was voluntary and the data collected did not contain any patients’ related information. In addition to that, there were no questions in the survey that inquired about any confidential institution related information.

The Institutional Review Board of King Fahd Medical City, Riyadh, approved the study.

Results

The response rate to the survey was 82%. We received responses from 14 out of 17 potential respondent centers. All questions in the survey were answered by the responding centers. The names that were used officially by the respondent centers include drug information center (7 out of 14), drug and poison information center (6 out of 14), and drug information and medication utilization evaluation center (1 out of 14). The oldest center was established in 1978 and the most recent center was established in 2017. The working hours are variable but ranges from 7:30 am or 8 am as a starting time to 3:30 pm, 4 pm, or 5 pm as a closing time. The after hours, weekends, and availability of on call-person coverage were variable but very few centers (3 out of 14) are providing round-the-clock (24/7) services through an on-call staff. The services provided are only available to health care providers in 3 centers; however, they are available for both health care providers and the public in all other centers. Handling requests or questions related to poisoning cases is not available in 5 centers and one of those centers defer all poisoning cases to a poison control center, completely independent department, available within that specific health care institution. However, other centers may occasionally receive and respond to poisoning cases. The estimated average number of cases per month is low and ranges from 1 case per month in some centers and may reach 12–18 cases per month in another center. Table 2 presents the descriptive statistics for the available services.

In terms of number of staff employed and their qualifications, Table 3 presents detailed description. There is no medical toxicologist available to handle questions related to poisoning cases. However, pharmacists with toxicology subspecialty qualifications are available as part of the team in 4 centers.

Discussion

The nomenclature used for DICs and DPICs is overlapping among surveyed centers and their involvement in handling poisoning cases. DICs have no “poison” word included in their assigned names and still some are responding to poisoning cases questions. On the other hand, DPICs have the word “poison” but some are not involved in any poisoning
It would be very important for any future initiative promoting toxicology services to start with recommendations regarding nomenclature that describes the actual role of any drug and/or poison center. The toxicology field in Saudi Arabia is still not well developed and structured and therefore, reliable labeling of centers that potentially may contribute in advancing toxicology services can eliminate any potential confusion in the future. Our study is the first, up to our knowledge, to evaluate DICs and DPICs readiness and availability in handling poisoning cases, and therefore, can provide the groundwork for upcoming research and initiatives interested in promoting medical and clinical toxicology services in Saudi Arabia.

Although we do not expect DICs to perform in the capacity of poison control centers, we suggest that DICs and DPICs may advance toxicology resources by training physicians, pharmacists, and nurses in toxicology and poison control services. Masters’ degree programs in Pharmacology and Toxicology are available in Saudi Arabia for pharmacists who are interested in advancing their toxicology qualifications. To our knowledge, there are no current available local training programs in toxicology for physicians. Medical Toxicologists go abroad for board certification or clinical fellowship training. They can provide medical director role, bring the clinical knowledge and experience, and provide clinical training for medical trainees.

Poisoned patients present to Emergency Departments at all times, night and day. Optimal and timely care requires 24/7 access to expert toxicology information services. The current staffing for Saudi DICs and DPICs leaves patients and physicians without ready access to poison information during evenings, nights, and weekends. Networking and collaboration among those centers may mitigate part of the problem (e.g. staff shortage) in providing services during the underserved periods where an on-call staff can answer requests and questions from collaborating institutions’ health care providers.

The limitations in our study include the observational nature of the study design and the small sample size.

### Table 2. Descriptive statistics for the available services.

| Center | Working hours | On-Call | Weekends | Services beneficiaries (Healthcare Providers, Public or Both) | Poisoning cases/month |
|--------|---------------|---------|----------|-------------------------------------------------------------|-----------------------|
| 1      | 7:30 am–3:30 pm | No      | No       | Both                                                        | None                  |
| 2      | 8:00 am–4:00 pm | Yes     | No       | Both                                                        | 12–18                 |
| 3      | 8:00 am–4:00 pm | No      | No       | Both                                                        | None                  |
| 4      | 8:00 am–4:00 pm | Yes     | Yes      | Both                                                        | 6–10                  |
| 5      | 8:00 am–4:00 pm | No      | No       | Both                                                        | 1                     |
| 6      | 7:30 am–4:00 pm | No      | No       | Both                                                        | None                  |
| 7      | 7:30 am–4:30 pm | No      | No       | Both                                                        | 1–3                   |
| 8      | 7:30 am–3:30 pm | No      | No       | Both                                                        | None                  |
| 9      | 8:00 am–5:00 pm | No      | No       | Both                                                        | 3                     |
| 10     | 7:30 am–4:30 pm | Yes     | No       | Both                                                        | 7                     |
| 11     | 8:00 am–4:00 pm | Yes     | Yes      | Healthcare providers                                       | 3                     |
| 12     | 7:30 am–5:00 pm | No      | No       | Both                                                        | 1                     |
| 13     | 7:30 am–4:30 pm | Yes     | Yes      | Healthcare providers                                       | None                  |
| 14     | 8:00 am–4:00 pm | No      | No       | Healthcare providers                                       | 1                     |

*DPIC with WHO designation as poison control center.

This center defers all poisoning cases to a poison control center (WHO designated) available only within their health care institution.

### Table 3. Description of available staff members and their qualifications.

| Center | Number of staff | Staff qualifications                                         | Availability of a medical toxicologist in the team |
|--------|-----------------|-------------------------------------------------------------|---------------------------------------------------|
| 1      | 4               | Pharmacists with Masters in Pharmacology and Toxicology     | Not available                                     |
| 2      | 2               | Pharmacists with Masters in Pharmacology and Toxicology     | Not available                                     |
| 3      | 1               | Pharmacist                                                  | Not available                                     |
| 4      | 2               | PharmD and Pharmacy Residents                               | Not available                                     |
| 5      | 5               | Pharmacists                                                 | Not available                                     |
| 6      | 1               | PharmD                                                      | Not available                                     |
| 7      | 2               | Pharmacists and Clinical Pharmacists                        | Not available                                     |
| 8      | 9               | Pharmacists with Masters in Pharmacology and Toxicology     | Not available                                     |
| 9      | 3               | Clinical Pharmacists                                        | Not available                                     |
| 10     | 2               | Pharmacists with Masters in Pharmacology and Toxicology     | Not available                                     |
| 11     | 1               | Pharmacist                                                  | Not available                                     |
| 12     | 3               | Clinical Pharmacists                                        | Not available                                     |
| 13     | 2               | Clinical Pharmacists                                        | Not available                                     |
| 14     | 1               | Pharmacist                                                  | Not available                                     |

*DPIC with WHO designation as poison control center.

This center defers all poisoning cases to a poison control center (WHO designated) available only within their health care institution.
size drawn from the DICs and DPICs in a single metropolitan area. We chose this sample in part because the services in the capital city likely represent the best level of services in the Kingdom.

Another limitation in our sampling, we did not include the other 3 poison control centers listed in the WHO directory of poison centers, as of 30 September 2017 [3]. Our rationale was to include a homogenous sample that can be studied efficiently in an observational study method where the questions and the level of expected standards are almost comparable. The 2 DPICs listed in the WHO directory [3] as poison control centers met the inclusion criteria of our sample by being labeled as DPICs rather than poison control centers in their used nomenclature. However, results from all included centers imply the fact that none of them meet the WHO or the American Association of Poison Control Centers (AAPCC) requirements and standards for poison control centers. For example, one of the founding requirements is the presence of a medical toxicologist as a medical director for the poison control center, and our results showed that none of the surveyed centers has met this requirement.

Our study was not designed to assess the presumed 5 poison control centers as listed in the WHO directory [3] from the compliance and operations perspective for the WHO and AAPCC requirements for poison control centers. Future research should consider evaluating those centers and identify the potential measures of improvement in their mission and operations to serve the purpose of their existence. The overall impression from our point of view that they do not serve at the level they are supposed to be at, and this is likely due to multiple factors and the complexity in the governing structure for the health care system in Saudi Arabia.

We believe that providing timely and efficient toxicology care support and information cannot be achieved without investing time, personnel, financial resources to establish a nationwide poison control center or regional poison control centers. Poison information should be accessible round-the-clock (24/7) and available for both health care providers and public. Until we get there, DICs and DPICs can contribute greatly to advance and promote toxicology care by improving their employees’ qualifications, recruiting poison information specialists, connecting with medical toxicologists, increasing the time coverage for their services; and networking and collaborating with other centers to compliment their services which can positively impact patient care. Such an impact and contribution are timely aligned with the current and massive national reform (Vision 2030), including the advancement and privatization of the health care sector. Vision 2030 is an ambitious national reform program that extends to all vital sectors and promotes prosperity, progress and stability of the economy and the society.

Conclusion

DICs and DPICs in Saudi Arabia have a limited role in handling poisoning cases largely because they have limited work hours. In accord with the current Vision 2030 reform effort, establishing comprehensive poison control center services is a necessity for the health care system in the Kingdom of Saudi Arabia.

Disclosure statement

No potential conflict of interest was reported by the authors.

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