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PRACTICE REPORT

Pattern and determinants of poisoning in a teaching hospital in Riyadh, Saudi Arabia

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Abstract *Background:* The Drug and Poison Information Center (DPIC) at King Khalid University Hospital, Riyadh, Saudi Arabia, was founded in 1983. Since then it has responded adequately to queries from medical and non-medical callers from all over the Kingdom. Queries ranged from simple material identification to poisoning cases.
Objectives: To assess the pattern and circumstances of poisoning in the Kingdom of Saudi Arabia through reviewing data from DPIC in King Khalid University hospitals.
Methods: This is a retrospective study of referred cases and calls received by DPIC. All records and documentation forms during the study period were investigated.
Results: This study included 1161 cases. There were 7.9% infants, 52.9% under 5 years old, 7.2% between 6–12 years old and 32.0% more than 12 years old. Number of males with toxic exposure was almost equal to that of females. More than 92% of cases were toxic exposure through oral route. Causes of poisoning include drugs among 76.7% of cases followed by household chemicals (6.8%). Suicidal intention was reported among 25.6% of cases. Using multivariate regression analysis, significant predictors of suicidal attempts are more than 12 years old, patients who were exposed to more than one toxin and patient who came to the hospital within 1–3 h since poisoning.
Recommendations: Establishing and operating DPIC centers throughout the kingdom, in addition to implementing of legislations to ban over the counter selling of medications and to sell potentially dangerous chemicals in childproof containers.

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1. Introduction

King Khalid University Hospital (KKUH) is a 770-bed tertiary care, teaching facility. KKUH is located in the city of Riyadh, the capital of the Kingdom of Saudi Arabia. Riyadh is a city of around 4,000,000 population including both Saudi population and non-Saudi expatriates from different parts of the world.

KKUH mainly serves Riyadh city and the central region of the Kingdom. As it functions as a referral teaching hospital, cases are being referred to KKUH from all over the Kingdom

for further assessment and specialized management (Saddique, 2001). The Drug and Poison Information Center (DPIC), a major part of the pharmacy set-up, was founded in 1983. At times, it was the only available, well-equipped and qualified center in the area. It has been offering its valuable, informative and referenced advice to the medical hospital personnel, other medical facilities in the area in addition to the general public. Since then DPIC has responded adequately to queries from medical (i.e., physicians, pharmacists, nurses) and non-medical callers from allover the Kingdom. Queries ranged from simple material identification to poisoning cases. It covered queries regarding indications, dose calculations, frequencies, side effects, overdose management, stings and bites management, poisoning advice and other pharmaceutical and medical issues. National Drug and Poisoning Information Centers (DPIC) as well as worldwide centers, are staffed by pharmacists, nurses, and physicians who have specific expertise in the provision of drug and poison information services (AlArifi et al., 2003). The original mandate of the Center called for the development of centralized services to assist health professionals in providing optimal levels of drug therapy and poison management. Eventually, these centers are utilized by pharmacist in their daily practice followed by physicians as a resource to provide the best possible care by facilitating the rational use of drugs (Asiri et al., 2007).

During the period from 1983 to 1987, there were 7142 cases of accidental poisoning among children admitted to all Riyadh governmental hospitals. Household products were the most common poisoning agent, accounting for 59% of all cases followed by drugs (39%). Children aged one to two years were the most affected and the fatality rate was 0.1% (Al-Sekait, 1989). A 10 year retrospective study (1986–1996) of poisoning cases at King Khalid university hospital, Riyadh, Saudi Arabia revealed similar findings to reports of poison centers in US, where CNS depressants constituted the major group of ingested drugs, however, the majority of cases involved accidental ingestion by unsupervised children (Saddique, 2001). In a prospective study on 178 cases of accidental home poisoning admitted to the main children's hospital in Riyadh poisoning was found to account for 5.6% of the total annual admissions (Mahdi et al., 1983). AlHazmi (1998) reported that poisoning account for 7.2% of general hospital admissions to the pediatric departments in Jeddah (western of Saudi Arabia) (AlHazmi, 1998). This incidence of accidental childhood poisoning is quite high, compared with similar studies conducted in the USA (Litoviz et al., 1991; Litovitz and Manogurra, 1992), UK (Lawson et al., 1983), and different areas of Saudi Arabia (Al Hifze et al., 1995; Khalil, 1986).

This study is a further in-depth assessment of the pattern and circumstances of poisoning in the Kingdom of Saudi Arabia through reviewing data from DPIC in King Khalid University hospitals, Riyadh.

2. Methods

This is a retrospective study of referred cases and calls received by DPIC. All records and documentation forms during the study period were investigated. DPIC uses standard forms to record and document all incoming calls, queries and referred poisoning cases. These forms are set to standard level to contain: (a) information regarding the clinical pharmacist handling the case, the caller identity, and the poison in question and (b) information regarding the poisoning case, such as time of poisoning and hospital arrival, poison type, symptoms and management. Other data collected include answers for queries together with means of data search. Records were excluded if any of the following data was missed or incomplete: age, gender, type, route, time and quantity of the poison taken, symptoms, time of hospital arrival and management.

3. Statistical analysis

Data were entered into SPSS statistical program version 16, Chicago IL. Epi Info software program version 3.3 was also used for advanced statistics. Chi square test was applied to compare qualitative variables. Suicidal intention was treated separately as dependent variable in both univariate and multivariate logistic regression analysis. Age, gender, type of toxins, number toxins and time since poisoning were treated as independent categorical variables. Univariate data analysis was performed and expressed as crude odds ratios (ORs) and their confidence intervals (95% CIs). Multiple relationships were evaluated in multiple logistic regression model based on the backward stepwise selection, where significant variables from the univariate analysis were included. This procedure allowed the estimation of the strength of the relationship between each independent variable while taking into account the potential confounding effects of the other independent variables. Level of significance was determined at p-value < 0.05.

4. Results

This study included 1161 cases after exclusion of 53 records (4.38%) because of insufficient data. There were 92 (7.9%) infants (less than one year old), 614 (52.9%) under 5 years old children, 84 (7.2%) children between 6–12 years old and 371 (32.0%) more than 12 years old. Among patients more than 12 years old, there were 13 (1.1%) elderly patients more than 60 years old. Number of males with toxic exposures (n = 571) (49.2%) was almost equal to that of females (n = 590) (50.8%) (Table 1).

More than 92% of the studied cases (n = 1068) were exposed through oral route compared to 73 (6.9%), 18 (1.6%) and 2 (0.2%) cases through dermal, inhalation and injection, respectively (Table 1).

Causes of poisoning include drugs among 76.7% of cases (n = 890), household chemicals (e.g., Clorox, flash, cosmetics, etc) by 6.8% (n = 79), industrial chemicals or hydrocarbon materials (e.g., petrol) by 4.3% (n = 50) and insecticides/rodenticides by 3.9% (n = 45). However, 70 cases (6.0%) were exposed to poisoning episode because of stings and bites by wild or tamed animals (Table 1).

Eighty-nine percent of cases (n = 1073) were exposed to only one toxin, others were exposed to two (7.5%), three (2.2%) or four (1.3%) materials (Table 1).

About 19% of those more than 12 years old were exposed to two or more toxins compared to 8.3% among children 6–12 years, 7.5% among children 1–5 years and 5.4% among infants (χ^2 = 34.63, p = 0.001) (Fig. 1). On the other hand, 14.7% of females took two or more toxins compared to 7.2% among males (χ^2 = 16.93, p = 0.001) (Fig. 2). Fourteen percent of those who were exposed to drugs took more than