Original Article

Patients with Toxicological Exposures Consulted to Siriraj Poison Control Center: The Analysis of Different Age Groups

Kriengsoontornkij W, MD[1,2], Jiranantakan T, MD, MPH[3,4,5], Ruenglerdpong S, MD[6], Mitsungnern T, MD[7], Phannarus H, MD[3]

[1] Siriraj Poison Control Center, Siriraj Hospital, Bangkok, Thailand
[2] Department of Pediatric, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[3] Department of Preventive and Social Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[4] New South Wales Poisons Information Centre, Sydney Children's Hospitals Network, Sydney, Australia
[5] Drug Health Clinical Services, Royal Prince Alfred Hospital, Sydney, Australia
[6] Prachupkhirikhan Hospital, Prachupkhirikhan, Thailand
[7] Department of Emergency Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Background: Human poisoning is not a common cause of death, but it secondarily leads to mortality by introducing injuries or cancers. The last update of human toxicological exposure in Thailand was published by Ramathibodi Poison Center (RPC) between 2001 and 2004. The authors want to update the toxicological exposure and focus on the differences between age groups to establish a prevention program for each group.

Objective: To explore toxicological exposure in humans, types of xenobiotics, clinical patterns, treatment and outcomes of intoxicated patients that were referred to the Siriraj Poison Control Center (SiPCC).

Materials and Methods: This is a retrospective study that included all cases that were referred to SiPCC from 2010 to 2012. Data were recorded into a paper-based form by pharmacists who were trained as the specialist in poison information, abstracted variables by two physicians, and validated data by three toxicologists. Data were analyzed by descriptive statistical method using SPSS version 18.0.

Results: The authors included 4,591 cases from 4,509 events. The incidences of human exposure were 1.89, 2.22, and 2.69 per 100,000 population in 2010, 2011, and 2012, respectively. The most common route of exposure was ingestion and a half of cases were suicidal gesture. The common agents that contributed to exposures were medications (35%), pesticides (29%), and household products (12.4%). The overall mortality ratio was 4.4 percent. Common xenobiotics that led to death were paraquat, carbamate, psychoactive medications, and acidic corrosive. The accidental ingestion occurred in all age-groups: children (4.9%), adult (5.6%) and elderly (15.4%).

Conclusion: The authors report significant aspects of patients with toxicological exposure in children, adults, and the elderly age groups and recommend a prevention program on mental health, pesticide handling (paraquat, carbamates), medication safety (psychoactive medications), and corrosives handling. Whereas, accidental ingestion from non-original containers occurred among all age groups, not only children as previous understood.

Keywords: Human intoxication, Age group, Clinical patterns, Mortality, Poisoning prevention

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Human intoxication may not be a common cause of death in Thailand[(1)] and worldwide[(2)], but it indirectly leads to mortality as a result of injury or cancer. There are two poison centers in Thailand that provide consultation service for toxicologic exposure as 24/7 tele and bedside consultation namely Ramathibodi Poison Center (RPC) and Siriraj Poison Control Center (SiPCC). Wananukul W and associates reported a retrospective review of human exposure referred to RPC from 2001 to 2004. In such study, there were 15,016 cases of human poisoning and the incidence was 6.0 per 100,000 population per year. Pesticides, household products, and pharmaceutical products were the top three most common poisons involved in human exposure (41.5%, 19.5%, and 18.9%, respectively). The common age ranges that had the high rate of poison exposure were children 0 to 6 years old, teenagers 13 to 19 years old and adults 20 to 29 years old, which were accounted for 33.0, 24.5, and 10.5 exposures per 100,000 population per year, respectively[(3)]. Paholpak P and associates reported that the incidence of suicide was 35.6 cases per 100,000 population per year from the Thailand suicide study of 2010. One third of these patients had some psychiatric conditions. Eighty-nine percent of these patients used xenobiotics for self-harm. Pesticide contributed the

Correspondence to:
Phannarus H.
Department of Preventive and Social Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.
Phone: +66-2-4197284, **Fax:** +66-2- 4115034
E-mail: hphannarus@gmail.com

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highest mortality (10.6%)[4]. As current data concerning toxicologic exposure in humans is from almost twenty years ago; hence we aim to update characteristics of intoxicated patients in Thailand and differentiate characteristics between age groups.

Materials and Methods

This is a retrospective study that enrolled all toxicological consultations to SiPCC from January 1st, 2010 to December 31th, 2012. All data were recorded into paper-based record forms by pharmacists who were trained as the specialist in poison information (SPI). The data were abstracted by two general practitioners. Finally, the data were validated by three toxicologists. The data were analyzed by SPSS version 18.0. Descriptive analysis was performed and reported as mean, standard deviation, ratio, and percentage. This research protocol was approved by Siriraj Institutional Review Board (IRB), Faculty of Medicine Siriraj Hospital, Mahidol University (336/2560).

Results

Total number of cases was 4,591 and most of the callers were physicians (4,509 calls, 98.2%). The number of records was gradually rising from 1,271, 1,496, and 1,824 cases in 2010 to 2012, respectively. The number of populations in Thailand from worldometer website was 66,692,024, 66,902,958, 67,164,130 people in 2010 to 2012[5]. After we excluded cases with unrelated effects in each year, the remaining intoxicated patients were 1,258, 1,484, and 1,807 cases in 2010, 2011, and 2012, respectively. The incidences of human exposure of any xenobiotic in Thailand that referred to SiPCC were 1.89, 2.22, and 2.69 per 100,000 population in 2010 to 2012, respectively.

Fifty-one percent of cases were male and the mean age was 30.11 years. All patients were classified to relevant age groups namely children (0 to 14 years), adult (15 to 64 years), elderly (65 years or older) and unknown if age was not indicated. Other details of demographic data are shown in Table 1.

Majority of cases were intentional (58.6%) exposures. Intentional exposure was predominated in the adult group, while unintentional exposure was more evidenced in the children and elderly groups. Most cases (51%) which were exposed to xenobiotic resulted from suicide attempts with the second ranking accidental exposure (27.7%). Types and reasons of exposure are described in Table 2.

Most of cases (90.3%) were reported healthy. Some 447 cases had comorbidities that were classified as organic disorders (253 cases, 5.5%), psychiatric disorders (164 cases, 3.6%), and combined disorders (30 cases, 0.7%). The elderly age group had the highest percentage of cases with known underlying diseases (27.7%). Only 9 cases in our series were found pregnant (0.0035% of total women).

Amongst all accidental cases, there were 6 percent involved with putting substance in non-original containers. The maximal number of cases in this group was adult, but the highest percentage of cases (15.4%) was elderly group (Table 3).

Over eighty-three percent (3,827 cases) developed at least one symptom after exposure. The most common abnormal clinical signs and symptoms divided by organ systems were gastrointestinal (40.8%). The children had the least severe symptoms in every organ system at first visit. Number concerning types of agents of exposure ranged from 1 to 10. Majority of cases (3,837 cases, 83.6%) exposed to single agent. The child age group tended to be exposed to a single agent while the adult group tended to be exposed to a combination of agents.

In all cases, with multiple substances exposure, we indicated a single agent that contributed to the major clinical manifestations presented to the hospital. Each agent was classified as pharmaceutical drugs, pesticides, household products, solvents, animal toxins, plant toxins, other or unknown. Top three classifications of main agents were pharmaceutical drugs (35%), pesticides (29%), and household products (12.4%). In analysis within the age groups, the most common poisoning in children and adult was pharmaceutical drugs, but in elderly was pesticides (Table 4).

The main route of exposure was ingestion that accounted for 90 percent. Only 34 cases (0.7%) were exposed to xenobiotics by more than one route. Inhalation was the second most common route of exposure but it was only 3.5 percent of total cases. Almost percent of patients in our series received at least one type of decontamination. Gastrointestinal decontamination was the majority which involved gastric lavage 1,206 cases (26.3%) and single dose activated charcoal 1,196 cases (26.1%). In contrast, whole

Table 1. Demographic data of patients by age groups

Demographic data	Total (n = 4,591)	0 to 14 years old (n = 930)	15 to 64 years old (n = 3,311)	≥65 years old (n = 274)	Unknown age (n = 76)
Age, mean ± SD (years)	30.11±19.58	4.53±4.15	33.68±12.67	73.66±6.88	NA
Gender, n (%)					
Male	2,341 (51)	478 (51.4)	1,682 (50.8)	152 (55.5)	29 (38.2)
Female	2,158 (47)	379 (40.8)	1,629 (49.2)	121 (44.2)	29 (38.2)
Unknown	92 (2)	73 (7.8)	0 (0)	1 (0.4)	18 (23.6)
Male/female ratio	1.08	1.26	1.03	1.26	1.0
No underlying disease, n (%)	4,144 (90.3)	906 (97.4)	2,968 (89.6)	198 (72.3)	72 (94.7)

Table 2. Types and reasons of exposure divided by age groups

Types and reasons of exposure	Total (n = 4,591)	Children 0 to 14 years old (n = 930)	Adult 15 to 64 years old (n = 3,311)	Elderly ≥65 years old (n = 274)	Unknown age (n = 76)
Intention of exposure, n (%)					
Unintentional	1,880 (41.0)	798 (85.8)	891 (26.9)	141 (51.5)	50 (65.8)
Intentional	2,691 (58.6)	124 (13.3)	2,413 (72.9)	131 (47.8)	23 (30.3)
Unknown	20 (0.4)	8 (0.86)	7 (0.2)	2 (0.7)	3 (3.9)
Reasons of exposure, n (%)					
Accidental	1,270 (27.7)	732 (78.7)	451 (13.6)	64 (23.4)	23 (30.3)
Occupational	106 (2.3)	0 (0)	82 (2.5)	6 (2.2)	18 (23.7)
Environmental	13 (0.3)	0 (0)	11 (0.3)	2 (0.7)	0 (0)
Therapeutic error	126 (2.7)	23 (2.5)	74 (2.3)	23 (8.4)	6 (7.9)
Misuse	213 (4.6)	34 (3.7)	159 (4.8)	18 (6.6)	2 (2.6)
Intentional ingestion as food	396 (8.6)	59 (6.3)	272 (8.2)	60 (21.9)	5 (6.6)
Suicide	2,359 (51.4)	63 (6.8)	2,182 (65.9)	96 (35.0)	18 (23.7)
Abuse	74 (1.6)	10 (1.1)	61 (1.8)	2 (0.7)	1 (1.3)
Criminal	12 (0.3)	1 (0.1)	10 (0.3)	1 (0.4)	0 (0)
Abortion	2 (0.1)	0 (0)	2 (0.1)	0 (0)	0 (0)
Unknown	20 (0.4)	8 (0.9)	7 (0.2)	2 (0.7)	3 (3.9)

Table 3. Accidental exposure involved with non-original container divided by age groups

Accidental exposure involved with non-original container	Total (n = 4,591)	Children 0 to 14 years old (n = 930)	Adult 15 to 64 years old (n = 3,311)	Elderly ≥65 years old (n = 274)	Unknown age (n = 76)
Not involved with non-original container, n (%)	4,192 (91.3)	875 (94.1)	3,024 (91.3)	222 (81.0)	71 (93.4)
Involved with non-original container, n (%)	274 (6.0)	46 (4.9)	185 (5.6)	42 (15.4)	1 (1.3)
Unknown, n (%)	125 (2.7)	9 (1.0)	102 (3.1)	10 (3.6)	4 (5.3)

Table 4. Classification of main agents divided by age groups

Classification of main agents	Total (n = 4,591)	Children 0 to 14 years old (n = 930)	Adult 15 to 64 years old (n = 3,311)	Elderly ≥65 years old (n = 274)	Unknown age (n = 76)
Pharmaceutical drugs, n (%)	1,609 (35.0)	341 (36.7)	1,173 (35.4)	80 (29.2)	15 (19.7)
Pesticides, n (%)	1,330 (29.0)	153 (16.5)	1,073 (32.4)	94 (34.3)	10 (13.2)
Household products, n (%)	567 (12.4)	127 (13.7)	410 (12.4)	25 (9.1)	5 (6.6)
Solvents, n (%)	172 (3.7)	61 (6.6)	98 (3.0)	12 (4.4)	1 (1.3)
Animal toxins, n (%)	145 (3.2)	29 (3.1)	100 (3.0)	11 (4.0)	5 (6.6)
Plant toxins, n (%)	119 (2.6)	32 (3.4)	70 (2.1)	13 (4.7)	4 (5.3)
Unknown, n (%)	23 (0.5)	7 (0.8)	15 (0.5)	1 (0.4)	0 (0)
Others, n (%)	626 (13.6)	180 (19.4)	372 (11.2)	38 (13.9)	36 (47.4)

bowel irrigation (WBI), induced vomiting, and syrup of ipecac were rarely used. Enhanced elimination was pursued in a very small number of cases. Multiple doses of activated charcoal were used in 54 cases (1.2%). Dialysis was performed in only 32 cases (0.7%). Majority of cases (87.8%) were admitted to the hospital. Some 107 cases required admission to intensive care unit (2.3%) and 470 cases (10.2%) were endotracheally intubated. Antidote and specific treatments were given to 792 cases (17.3%). In comparison to all age groups, patients in children age group required airway control as well as antidote and specific treatment in least percentage (2.9% and 9.5%, respectively). Antidotes were used most

Table 5. Final outcomes divided by age group

Final outcomes, n (%)	Total (n = 4,591)	Children 0 to 14 years old (n = 930)	Adult 15 to 64 years old (n = 3,311)	Elderly ≥65 years old (n = 274)	Unknown age (n = 76)
No effect	259 (5.6)	252 (27.1)	4 (0.1)	2 (0.7)	1 (1.3)
Minor effect	2,920 (63.6)	459 (49.4)	2,243 (67.7)	177 (64.6)	41 (53.9)
Moderate effect	426 (9.3)	116 (12.5)	275 (8.3)	29 (10.6)	6 (7.9)
Major effect	270 (5.9)	20 (2.2)	220 (6.6)	25 (9.1)	5 (6.6)
Death	200 (4.4)	5 (0.5)	174 (5.3)	16 (5.8)	5 (6.6)
No follow-up/nontoxic	41 (0.9)	40 (4.3)	0 (0)	0 (0)	1 (1.3)
No follow-up/minimal toxicity	354 (7.7)	23 (2.5)	305 (9.2)	15 (5.5)	11 (14.5)
No follow-up/potentially toxic	79 (1.7)	10 (1.1)	58 (1.8)	6 (2.2)	5 (6.6)
Unrelated effect	42 (0.9)	5 (0.5)	32 (1.0)	4 (1.5)	1 (1.3)

often included N-acetylcysteine, Atropine with or without pralidoxime, immunosuppressive therapy for paraquat poisoning and venomous snake antivenom, respectively.

Final outcomes were coded as definitions described by the American Association of Poison Control Centers. A majority of cases consulted in our series had minor effects (2,920 cases, 63.6%). The overall mortality ratio was 4.4 percent. For subgroup analysis, patients in elderly age groups had higher mortality than adult and children (5.8%, 5.3% and 0.5%, respectively). Only 41 cases (0.9%) had unrelated effect from toxicological exposure. More information is shown in Table 5.

The common agents leading to death in our series included paraquat (82 cases), carbamates (24 cases), Glyphosate (6 cases), Acidic corrosive agents (6 cases), and multiple psychoactive medications (6 cases).

Discussion

Demographic data

The peak incidence of poisoning in this study was 2.69 per 100,000 population in 2012. This was lower than the previous report in Thailand that was 6.0 per 100,000 population in 2001 to 2004[3]. This was a result of lower call volume made to SiPCC. Number of calls to RPC was about 2.5 times of that of SiPCC because the RPC was established 10 years earlier and had less digits in telephone numbers (only 4-digit) than the SiPCC. Both poison centers in Thailand provide free consultation service that serves the whole country but they have not assigned service zoning. In most cases, callers consult either poison center so it is best to report cases from both poison centers in order to represent Thailand's exposure to toxic agents.

Exposure

Overall, the incidence of intentional exposure was slightly greater than the unintentional one in this study. However, more than 90% of children aged less than 6 years old were still found unintentional as in previous references[3,6,7]. A well-known risk factor that makes children accidentally exposed to chemical substances is putting the left-over substance in a non-original container that usually is food or beverage containers. Spain reported in 2011 that they found 16.7% of children exposed to corrosive agents due to the product being kept in non-original container[8]. However, not only a non-original container was found in that many as the previous studies, but it was also more common in elderly than children in the present study. This is a preventable issue that requires serious attention. Elderly had many factors that placed them in risky situation such as low visual acuity, indecisive judgement, and mental impairment. While with the adults who reported themselves healthy, the incidence of non-original containers was higher than children in our study. There are no explanations about this phenomenon, so we assumed that they were in a rush, neglectful, or had poor judgement from inebriation. From our best knowledge, no study about elderly and intoxication from a substance put in non-original container was reported in medical literature.

Number of types of agents

The adult and elderly age groups were exposed to a greater number of types of agents than that of children age group. The authors expected that adult and elderly patients to have the potential to be exposed to more kinds of xenobiotics than was noted in previous studies by Christian R. et al. They studied Swedes who were at least 50 years old who took unintentional toxicity from polypharmacy. It was also reported that the risk factor of inappropriate drug use (IDU) associated with hospitalization or death were taking three or more medications by the adjusted odd ratio which was 1.5 (95% CI, 1.2 to 2.0)[9]. Prescriptions were the smallest number of types of medications that may prevent both intentional and unintentional intoxication by polypharmacy. With regard to categories of agents, our top three rankings included pharmaceutical drugs (35%), pesticides (29%), and household products (12.4%). It was different from the results reported by RPC study that included pesticides (41.5%) and household product (19.5%). Pharmaceutical products were reported as the main agent at 18.7 percent[3]. This could be explained by different structures of both poison centers.

While RPC's SPI provides mainly toxicology consultation by nurses and scientists, SiPCC provides both toxicology consultation service and a drug information center by pharmacists.

Final outcomes

Most of patients in the present study had minor effect that accounted for 63.6 percent. The overall mortality rate was 4.4 percent which was slightly lower than the mortality rate of cases reported in RPC study (5.5%) in 2001 to 2004[3]. However, it was quite higher than the death rate of AAPCC study (0.07%) in 2012[6]. For subgroup analysis, the death rate of elderly (5.8%) was higher than adult (5.3%) and children (0.5%) age groups. The death rate in children age group from our study was different from study in India that the death rate was 7.7% percent[10].

Interestingly, the unrelated effect was reported for 0.9%. The common xenobiotic agents led to mortality by poisoning were paraquat, carbamate, glyphosate, acidic corrosive agent, and multiple psychoactive medications. This was different from reported from developed country such as USA. Pesticides were not in the top five list of common exposure of 2012 and 2015 AAPCC reports[6,7]. The services of poison centers in Thailand are free. People and healthcare providers can consult to any poison centers without zoning and not strict to consultation criteria.

The strength of this study is that it is the first to explore about accidental ingestion of chemicals contained in non-original bottles in the elderly. However, we aware that there might be potential limitations. First, our database is handwritten on paper therefore some data is incomplete and difficult to read. Secondly, the final out come data was based on telephone interviews, therefore, there might be a recall bias. Finally, the records about xenobiotic of exposure are incomplete because the callers have no data. Examples; the properties of xenobiotic (the concentration and pH of solution), amount and volume of xenobiotic and dilution are estimated by patients. So, we do not report in the present study.

Conclusion

The information from the present study was reconciled to the report from Ramathibodi Poison Center in most aspects except the classifications of agents that contributed to most prevalence. The authors recommend that it is necessary to focus on prevention in order to reduce the incidence of toxicological exposure in Thailand especially the agents that cause major mortality such as paraquat, carbamates, glyphosate, acidic corrosive agent, and psychoactive medications. It is also important to pay more attention to prevent accidental exposure to substance that is contained in non-original containers.

What is already known on this topic?

As the retrospective review in Thailand from 2001 to 2004, we found pesticides, household products, and pharmaceutical products were the top three most common poisons. The most common age that had the high rate of poison exposure were children from 0 to 6 years old. The incidence of suicide was a higher rate and one-third of these patients had some psychiatric conditions. Eighty-nine percent of these patients used xenobiotics for self-harm. Pesticide contributed the highest mortality. However, these data was out of date because it was 20 years old.

What this study adds?

The present study demonstrated that the most common route of exposures was ingestion and a half of cases were suicidal gesture. The common agents that contributed to exposure were medications, pesticides, and household products, respectively. Common xenobiotics that led to death were paraquat, carbamate, psychoactive medications, and acidic corrosive. Accidental ingestion occurred in all age groups. We suggest to establish the mental health promotion, suicide prevention program, and good chemical handling practice.

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Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Porapakkham Y, Rao C, Pattaraarchachai J, Polprasert W, Vos T, Adair T, et al. Estimated causes of death in Thailand, 2005: implications for health policy. Popul Health Metr 2010;8:14.
2. World Health Organization. WHO methods and data sources for country-level causes of death 2000-2015. Global Health Estimates Technical Paper WHO/HIS/IER/GHE/2016.3 [Internet]. 2010 [cited 2017 May 22]. Available from: https://www.who.int/healthinfo/global_burden_disease/GlobalCOD_method_2000_2015.pdf.
3. Wananukul W, Sriapha C, Tongpoo A, Sadabthammarak U, Wongvisawakorn S, Kaojarern S. Human poisoning in Thailand: The Ramathibodi Poison Center's experience (2001-2004). Clin Toxicol (Phila) 2007;45:582-8.
4. Paholpak P, Rangseekajee P, Arunpongpaisal S, Piyavhatkul N, Thepsuthammarat K, Paholpak S. Characteristics and burden of hospitalization because of intentional self-harm: Thai national, hospital-based data for 2010. J Med Assoc Thai 2012;95 Suppl 7:S156-62.
5. Worldometer. Thailand population (Live) [Internet]. 1950-2017 [cited 2017 May 22]. Available from: http://www.worldometers.info/world-population/thailand-population/.
6. Mowry JB, Spyker DA, Cantilena LR Jr, Bailey JE, Ford M. 2012 Annual report of the American Association of Poison Control Centers' National Poison Data System

(NPDS): 30th annual report. Clin Toxicol (Phila) 2013;51:949-1229.
7. Mowry JB, Spyker DA, Brooks DE, Zimmerman A, Schauben JL. 2015 Annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 33rd annual report. Clin Toxicol (Phila) 2016;54:924-1109.
8. Rodriguez Guerineau L, Martinez Sanchez L, Quintilla Martinez JM, Trenchs Sainz De La Maza V, Vila Miravet V, Luaces Cubells C. Caustic ingestion: current situation and review of updated recommendations. An Pediatr (Barc) 2011;75:334-40.
9. Rausch C, Laflamme L, Bultmann U, M□ller J. Number of medications and adverse drug events by unintentional poisoning among older adults in consideration of inappropriate drug use: a Swedish population-based matched case-control study. Eur J Clin Pharmacol 2017;73:743-9.
10. Brata Ghosh V, Jhamb U, Singhal R, Krishnan R. Common childhood poisonings and their outcome in a tertiary care center in Delhi. Indian J Pediatr 2013;80:516-8.

ผู้ป่วยสัมผัสพิษที่ปรึกษาศูนย์พิษวิทยาศิริราช: การวิเคราะห์ในกลุ่มอายุที่แตกต่าง

วรพันธ์ เกรียงสุนทรกิจ, ธัญจิรา จิรนันทกาญจน์, สุชาดา เรืองเลิศพงศ์, ฐปนวงศ์ มิตรสูงเนิน, หฤษฎ์ ปัณณะรัส

ภูมิหลัง: ภาวะพิษในมนุษย์ไม่ใช่สาเหตุการตายที่พบบ่อย แต่เป็นเหตุให้เสียชีวิตโดยอ้อมจากการทำให้บาดเจ็บหรือก่อมะเร็ง ข้อมูลล่าสุดของไทยเกี่ยวกับการสัมผัสพิษในมนุษย์ตีพิมพ์โดยศูนย์พิษวิทยารามาธิบดีระหว่างปี พ.ศ. 2544 ถึง พ.ศ. 2547 ดังนั้นคณะผู้นิพนธ์จึงต้องการปรับปรุงข้อมูลการสัมผัสสารพิษให้ทันสมัยและมุ่งเน้นความแตกต่างระหว่างกลุ่มอายุเพื่อวางแนวทางการป้องกันในแต่ละกลุ่มอายุ

วัตถุประสงค์: เพื่อศึกษาการสัมผัสพิษ ชนิดของสาร อาการทางคลินิก การรักษาและผลลัพธ์ของผู้ป่วยได้รับพิษที่ปรึกษาศูนย์พิษวิทยาศิริราช

วัสดุและวิธีการ: การวิจัยนี้เป็นการวิจัยย้อนหลังโดยรวบรวมผู้ป่วยทุกรายที่ปรึกษามาที่ศูนย์พิษวิทยาศิริราชตลอดปี พ.ศ. 2553 ถึง พ.ศ. 2555 ข้อมูลบันทึกบนแบบฟอร์มโดยเภสัชกรที่ได้รับฝึกให้เป็นผู้เชี่ยวชาญในการให้ข้อมูลด้านพิษวิทยา ดึงข้อมูลสำคัญมาวิเคราะห์โดยแพทย์ผู้ช่วยวิจัยสองท่าน และตรวจสอบความถูกต้องของข้อมูลโดยแพทย์พิษวิทยา 3 ท่าน วิเคราะห์ข้อมูลโดยสถิติเชิงพรรณนาด้วยโปรแกรม SPSS version 18.0

ผลการศึกษา: คณะผู้นิพนธ์รวบรวมผู้ป่วยได้ 4,591 ราย จากเหตุ 4,509 ครั้ง อุบัติการณ์ของผู้ป่วยสัมผัสพิษคือ 1.89, 2.22, และ 2.69 ต่อประชากรหนึ่งแสนราย ในปี พ.ศ. 2553, 2554, และ 2555 ตามลำดับ ช่องทางที่สัมผัสคือการกินและครึ่งหนึ่งของทั้งหมดเป็นการทำเพื่ออัตวินิบาตกรรม สารที่สัมผัสบ่อยคือยา (35%) สารปราบศัตรูพืช (29%) และผลิตภัณฑ์ในครัวเรือน (12.4%) อัตราตายคิดเป็นร้อยละ 4.4 โดยสารต้นเหตุที่ทำให้เสียชีวิตที่พบบ่อยคือพาราควอท และคาร์บาเมต ส่วนการสัมผัสโดยไม่ตั้งใจเกิดขึ้นในทุกกลุ่มอายุโดยเด็ก (4.9%) ผู้ใหญ่ (5.6%) และผู้สูงอายุ (15.4%)

สรุป: คณะผู้นิพนธ์รายงานข้อมูลที่สำคัญของสัมผัสพิษในกลุ่มเด็ก ผู้ใหญ่ และผู้สูงอายุ โดยเสนอให้มีแนวทางป้องกันด้านสุขภาพจิต การจัดเก็บสารปราบศัตรูพืช (พาราควอท คาร์บาเมต) ความปลอดภัยในการใช้ยา (ยาที่ออกฤทธิ์ต่อจิตประสาท) และการจัดเก็บสารกัดกร่อนประเภทกรด ในขณะที่การกินสารพิษโดยไม่ตั้งใจจากบรรจุภัณฑ์ที่แบ่งบรรจุที่ไม่ใช้บรรจุภัณฑ์เดิมของผลิตภัณฑ์พบได้ในทุกกลุ่มอายุ ไม่ใช่เฉพาะกลุ่มเด็กตามที่เข้าใจในอดีต