



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
على هذه الأفلام قد أعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of  
15-25- c and relative humidity 20-40%

# **Evaluation of different grading systems for assessment of the severity of acute poisoned cases**

Thesis submitted to *6/10/2007*  
Faculty of Medicine  
Alexandria University  
in Partial Fulfillment of the  
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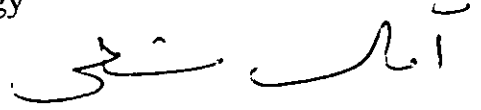
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## Abbreviations

|                                                  |         |
|--------------------------------------------------|---------|
| - Acute Physiology And Chronic Health Evaluation | APACHE  |
| - Alexandria Poison Unit                         | A P U   |
| - Blood Urea Nitrogen                            | B U N   |
| - Carbon monoxide                                | CO      |
| - Enzym Mediated Immunoassay Technique           | E M I T |
| - Fluorescence Polarization Immunoassay          | F P I A |
| - Gas Chromatography                             | G C     |
| - Gas Chromatography- Mass Spectroscopy          | G C-M S |
| - Glasgow Coma Scale                             | G C S   |
| - High Performance Liquid Chromatography         | H P L C |
| - Intensive Care Unit                            | I C U   |
| - Mono Amine Oxidase                             | M A O   |
| - Mortality Prediction Model                     | M P M   |
| - Multicentre Study of Poisoning in Children     | M S P C |
| - Poisoning Severity Score                       | P S S   |
| - Radio Immuno Assay                             | R I A   |
| - Randomized Control Trials                      | R C T s |
| - Simple Acute Physiology Score                  | S A P S |
| - Thin Layer Chromatography                      | T L C   |

# ***Introduction***

The science of poisoning, has become an important aspect of modern medicine as attention has been concentrated in recent years on the health effects in man of a constantly expanding number of toxic substances.

## **DEFINITION OF A POISON:**

It is not an easy matter to define a poison, as almost any substance is liable to exert serious effects upon the body when taken in a sufficiently large amount. Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity . Poisoning is defined as “ to injure or kill with a poison or a chemical substance that usually kills, injures or impairs an organism.”<sup>(1)</sup> The terms poisoning and drug overdose often are used interchangeably, especially with prescription drugs, although by definition, a drug overdose does not produce poisoning unless it causes symptoms.<sup>(2)</sup>

The poisonous substance may be swallowed, injected, inhaled, applied to the skin, or introduced into the body orifices.<sup>(1)</sup>

A medicine in large dose is a poison and a poison in small dose may be medicine . In small amounts, poisons such as arsenic and cyanide can be consumed without ill effect.<sup>(3)</sup>

In clinical theatre, any patient presenting with multi-system involvement should be suspected of poisoning until proven otherwise. The great rise in the number of patients of acute poisoning all over the world has become a real problem since it is not limited to any geographic, economic or social group.<sup>(4)</sup> Hence, it must be managed seriously from medical, psychiatric, as well as social aspects.<sup>(5)</sup>

Today, poisoning , both accidental and intentional are a significant contributor to mortality and morbidity in the United States . It has been

estimated that seven percent of all emergency room ( ER ) visits are the results of toxic exposures.<sup>(6)</sup>

Toxic Exposure Surveillance System ( TESS ) data compiled by the American Association of Poison Control Centers (AAPCC) in 2001 reported 2,267,979 human exposure cases by 64 participating poison centers in the United State of America ( USA ) , with an increase 4.6 % compared with 2000 poisoning reports .<sup>(7)</sup>

It has been estimated that there are 4-5 million cases of poisoning per year in the United States in 1997.<sup>(8)</sup>

On the basis of the annual reports of the Japanese National Research Institute of Police Science , there were 3,195 cases of poisoning in 1996. <sup>(9)</sup>

From the annual stastistical report of the Poison Unit of Main Alexandria University Hospital, the number of cases of acute poisoning admitted during the year 2001 were 10,210 patients.<sup>(10)</sup>

## HISTORIC SURVEY OF POISONING

The history of poisoning is as old as mankind. The knowledge of animal venoms and poisonous plants has been used by earliest man. In some instances, this knowledge of poisons( e.g. curare) was used for hunting. Hippocrates, Aristotle and Nero were scientists greatly interested in poisons. Later, the Romans used poisons in assassinations. The most powerful historic influence on the science of toxicology was PARACELSUS who realized that the difference between the therapeutic and highly toxic effects of a substance is dose related. He also authored the first monograph on the occupational diseases of miners and smelters.<sup>(11)</sup>

The Greek physician Hippocrates (460-370 B.C.), the father of medicine, separated medicine from religion and philosophy to make it an independent subject. He wrote on snake bites and described severe colic in men who extracted metals. His writings show that the ancient Greeks had a knowledge of treating poisons by influencing absorption. Historically, toxicology formed the basis of therapeutic and experimental medicine.<sup>(12)</sup>

Toxicology in this century continues to develop and expand by assimilating knowledge and techniques from most branches of biology, chemistry, mathematics and physics.<sup>(12)</sup>

Starting from the 20th century, the major focus became finding the treatment to different poisons and the antidotes. The tremendous advances in pharmaceuticals, along with new technology have given way to more effective treatments. The growth of emergency medicine has also served to focus more attention on applied toxicology. Skilled emergency physicians are important in rapidly diagnosing and initiating suitable treatment.<sup>(11)</sup>

## **CIRCUMSTANCES OF ACUTE POISONING**

The circumstances of poisoning can be 'accidental', 'self-induced' or 'homicidal' poisoning.

### **A) ACCIDENTAL POISONING:**

It is a major health problem. Overcrowded houses, lack of facilities for rest and recreation, physical fatigue, undue mental tension and worries are some of the evident factors responsible for the high incidence of accidental poisoning.<sup>(13)</sup>

Accidental poisoning occurs at all ages, but most frequent between one and four years. Children still at the crawling stage (under two years) are more likely to be poisoned by agents stored at low levels, whereas children of three or four years can climb to reach poisons at higher levels. At these ages, children are active, intensely curious and often in a strong negativistic phase.<sup>(14)</sup>

Acute poisoning in children is a major problem for health authorities world wide and is responsible for serious morbidity and mortality risks.<sup>(15,16)</sup>

The idea of children coming across the poison by chance and happening to put it into the mouth is too simple an explanation and the word 'accidental' is a misnomer in the majority of cases. Children at this age have a strong urge to put things in their mouths for both identification and for oral gratification. Many of the substances they take are unpleasant both in appearance and in taste, so that the belief that the child eats the poison because it is "something nice he has found" untenable.<sup>(17)</sup>

Accidental poisoning occurs nearly twice as often among boys as among girls, perhaps because the former are more aggressive and exploratory by nature.<sup>(17)</sup>

Accidental poisoning may occur in older children and adults; particularly, as a result of mishaps at school or work. Examples include inhalation of gases such as Chlorine or fumes from organic solvents, ingestion of chemical reagents while pipetting or drinking some toxic fluid, which has been decanted, into soft drink bottle.<sup>(18)</sup>

In all countries, the substances ingested tend to reflect the customs of the people and their standards of living. Kerosene poisoning is very common in areas where this oil is used for lighting and heating. Children in rural areas are especially at risk from drinking insecticides. Poverty and high social mobility increase the likelihood of accidental poisoning since safe keeping of toxic preparations is less easy. Parents are likely to be less knowledgeable about the risks. Supervision may be less strict and in poor families, hunger may be a stimulus to ingestion of harmful substances. When a child has been accidentally poisoned, a careful follow up is essential if repetition of the incident is to be avoided.<sup>(17)</sup>

It was reported that children of psychologically disturbed families are also at greater risk.<sup>(19)</sup> Accidental poisoning may occur in any family. However, the children born to parents working in the medical field are particularly at risk because of the greater number of potentially toxic agents likely to be kept in the house. Most poisoning accidents take place in the home, usually in the kitchen or bathroom.<sup>(20)</sup>

Accidental poisoning with drugs may also occur in confused elderly patients who are prescribed large numbers of medicines. They may forget the dose and frequency with which each should be taken. The underlying

problem of arteriosclerosis dementia, confusion and forgetfulness are frequently aggravated or precipitated by inappropriate psychotropic medications. It is a continuing public health problem, accounting for the most exposures of patients > 64 years of age .<sup>(21)</sup>

## **B) SELF-INDUCED POISONING: (intentional poisoning):**

It is the deliberate, acute self-administration of a drug or poison with the intention of causing harm reaching death or in order to give the impression of such intention. Self-poisoning is usually a conscious, often impulsive act. It is undertaken to manipulate a situation or a person to secure circumstances, which have become intolerable.<sup>(22)</sup>

It is a method of suicide popular in females, young males and drug addicts.<sup>(23)</sup> Voluntary drug intoxication is a major medical and social problem in developing countries.<sup>(24)</sup>

There is a direct correlation between low socioeconomic class and both suicidal attempts and successful suicide. Moreover, unemployment, alcoholism and broken marriages contribute to self-poisoning.<sup>(25)</sup>

In 1965, Kessel<sup>(26)</sup> claimed that the term self-poisoning is preferable to attempted suicide, arguing that the former term aroused fewer preconceived notions in the mind. Some people injure themselves in order to appeal for help, to spite others, or to submit themselves to trial by ordeal.

It can be established fairly easily whether an overdose was taken deliberately, but it is not easy to say whether death was intended. All these behaviors are classed as attempted suicide. Kessel<sup>(26)</sup> stated that there are three essential components of the act:-

- It must be deliberate, not accidental.
- The risk of harm is appreciated by the patient prior to the act.
- The quantity must be known to be excessive

Hawton and Blackstock (1976)<sup>(27)</sup> defined self-poisoning as the intentional self-administration of more than the prescribed dose of any drug whether or not there was evidence that the act was intended to cause self-harm.

Premature death from suicide is estimated to be the tenth leading cause of death in the world and an estimated one million persons die worldwide from suicide each year, and between 10 and 15 million suicide attempts occur annually.<sup>(28)</sup>

### **C) HOMICIDAL POISONING:**

Homicide may be faced at any age. It may be committed while the person is under the influence of drugs or alcohol. Sporadic cases occur but in most cases the poisoning is subacute or chronic as with Antimony, Arsenic and Lithium. Paraquat and Ricin have been used as single dose homicidal poison.<sup>(29)</sup>