

# Recurrent Childhood Poisoning as a Family Problem

John Rogers, MD, MPH  
Piscataway, New Jersey

Childhood poisoning is a leading cause of death in children one to four years of age. This report reviews the recent literature regarding the causes of accidental poisonings and explores the potential for prevention through family centered behavioral intervention. Attributes of the host, agent, and environment related to single and repeat poisonings are highlighted. The children are usually under five years of age and exhibit distinguishing behavioral characteristics. Substances ingested include prescribed and over-the-counter medications or common household substances. Types of poisons, toxicity, and availability do not differ in homes of ingestors and noningestors. However, more major stresses in the family have been identified for ingestors than noningestors. A treatment approach based on social learning theory is proposed.

In 1976, accidents were the leading cause of death in children one to four years of age. All types of accidents killed 40 percent of the 8,606 one- to four-year-old children who died that year. Accidental childhood poisonings claimed approximately 170 of the 3,439 lives lost to accidents, making it the eighth leading cause of death in that age group.<sup>1</sup> Accidents are acute episodes, yet primary, secondary, and tertiary prevention are available to decrease the impact of these "diseases." Only the first two can hope to decrease the incidence, for tertiary prevention refers to efforts to decrease disability caused by the accident.

Thus, those factors associated with accidents that are amenable to intervention strategies must be identified if primary or secondary prevention are to be practiced. This paper will review pertinent studies that have attempted to identify variables associated with "accidental" poisonings.

## Literature Review

### *Host and Agent*

Murdock<sup>2</sup> and Calnan<sup>3</sup> both reported an incidence of poisonings of approximately 3.5/1,000/year for children 15 years old or younger. Calnan, however, noted that for children under 5 years of age the incidence of suspected poisoning was 8.7/1,000/year compared to 0.5/1,000/year for children 5 to 15 years old.<sup>3</sup> The incidence of repeated ingestion has not been reported. However, in a study of 400 families, Sobel reported 88 cases of single ingestors and 26 cases of repeated ingestors.<sup>4</sup>

Sobel and Margolis<sup>5</sup> reported that the poison

---

From the Department of Family Medicine, Rutgers University, College of Medicine and Dentistry of New Jersey, Piscataway, New Jersey. At the time this project was undertaken, Dr. Rogers was a Robert Wood Johnson Family Practice Fellow in the Department of Family Medicine, University of Washington, Seattle. Requests for reprints should be addressed to Dr. John Rogers, Department of Family Medicine, CMDNJ-Rutgers Medical School, University Heights, Piscataway, NJ 08854.

repeaters averaged nearly three episodes per child and were often under direct parental supervision at the time of the ingestion. The ingestors were also aware that the substances were forbidden, and the purposefulness of the behavior was beyond questioning. Okasha et al<sup>6</sup> and Sobel<sup>4</sup> both report behaviors that characterize repeat ingestors more than single ingestors and the latter more than noningestors: hyperactivity, temper tantrums, aggression, stubbornness, negativism, nocturnal enuresis, and general deviant behaviors. The developmental, health, and accident histories, however, were similar for the three groups.

Prescribed and over-the-counter medications or common household substances were ingested with similar frequencies and were involved in over 95 percent of the suspected poisonings.<sup>3</sup> The prescription and over-the-counter medications had been in use immediately before the accident in 91 percent of cases involving these agents.<sup>3</sup> Sobel assigned homes a hazard index score based on the toxicity and availability of commonly ingested agents.<sup>4</sup> He did not find a significant difference in the hazard index between homes of families experiencing a poisoning and homes of families without an ingestion. In fact, Sobel and Margolis noted that the homes of control families tended to be more hazardous than the homes of children who poisoned themselves.<sup>5</sup> These results indicate that the presence of a hazardous agent is necessary but not sufficient for the occurrence of a poisoning.

### *Environment—Family*

Sibert observed that families experiencing a poisoning had twice the number of major stresses as families not experiencing a poisoning episode.<sup>7</sup> The major stresses recorded were serious family illness, pregnancy in child's mother, family move in previous three months, one parent away from home, anxiety or depression in parents, and unemployment of father. Okasha et al<sup>6</sup> and Kuzomko<sup>8</sup> both noted that emotional and social problems were more common in families of repeat ingestors than in families of noningestors.

In the most thorough study to date, Sobel and Margolis compared 20 families of children who poisoned themselves two or more times (repeaters), 19 families of single ingestors, and 17 families with no experience of childhood poisoning. The mothers of poison repeaters came significantly more often from unhappy homes and more frequently

had emotionally unstable and/or alcoholic parents. Moreover, mothers of poison repeaters more often married because of pregnancy or the desire to escape an unhappy home. The parents of poison repeaters were more emotionally detached and sexually incompatible. Companionship and social activities also tended to be more limited in these families than in the single ingestor or control groups. The poison repeater was more often the result of an unplanned pregnancy, and the parents were often resentful of the pregnancy and disappointed with the child's sex. The current and past mother-child relationship in the poison repeater families was significantly more limited by maternal illness or emotional instability or by outside work than in the single ingestor or control families.

The preceding case-control studies have elucidated factors about the host, agent, and environment that are associated with single and repeat ingestion of potentially poisoning substances. It is difficult to determine whether repeat ingestors are a group distinct from single ingestors and non-ingestors or just a more severe form of the same continuum. This distinction is difficult to make based upon case-control studies, since the degree of the individual child's behavioral dysfunction and the family's dysfunction may be a result of the poisonings and not a cause. Alternatively, the families who have experienced a poisoning may report more individual and family dysfunction than families who have not experienced a poisoning episode. This major bias is eliminated by cohort studies. Unfortunately, there are currently no cohort studies in the poisoning literature in which detailed family observations were made before the poisoning episodes. Two cohort studies about all accidents, however, have confirmed that psychosocial stress, individual behavioral disturbance, and family psychiatric disease are associated with an increased accident rate.<sup>9,10</sup>

### **Prevention of Childhood Poisoning**

What are the implications of these findings for primary and secondary prevention? Until now, most efforts in prevention have been directed at agents involved in ingestion. A variety of approaches have been used, including taste of medication,<sup>11,12</sup> "Officer Ugg" and "Mister Yuk" stickers,<sup>13</sup> child-proof containers,<sup>14,15</sup> medicine cabinet locks,<sup>16</sup> and parent education.<sup>17</sup> The efforts have focused pri-

marily on availability and attractiveness of the agents. Of these programs, only safety caps have succeeded in lowering incidence and mortality.<sup>15,18,19</sup>

Several models for working with problem families have been advocated: family systems theory, family life cycle, cycle of family function, and social learning theory. These have not been empirically tested in this situation but may be helpful for planning primary and secondary prevention programs.

The family systems approach underscores the importance of the interrelatedness of individual behaviors.<sup>20,21</sup> It proposes that illness and illness behavior are adaptational or the consequences of maladaptation. The family life cycle outlines tasks and expected events to which the family system adapts.<sup>22,23</sup> The cycle of family function framework describes how life events, resources, and subsequent coping relate to family functioning and illness or illness behavior.<sup>24,25</sup> Social learning theory concerns how coping and family function become patterned and how they are maintained.<sup>26-28</sup>

Childhood poisoning more often occurs in families that have experienced several unexpected and undesirable events in addition to the expected developmental events. The context is characterized by disharmony, emotional instability, and limited companionship or social contacts. Relationships between family members are limited or detached, so the person's expressed needs are not acknowledged or elicited, and alternatives for coping are not furnished or created. The child's acts are described as negative, aggressive, hyperactive, and generally deviant. Some acts have rather predictable consequences, such as temper tantrums, nocturnal enuresis, and self-poisoning.

### *A Proposed Family Approach*

To prevent repetition of self-poisoning, the physician needs to alter the problem solving processes of the environment and the individuals. The physician furnishes the parents with existing options and creates new alternatives for dealing with the developmentally expected and the unexpected events, including the child's acts. The physician may see both parents or a single parent with or without the child or children.

The following are major treatment components:<sup>29</sup>

1. Instruction is provided in the monitoring of responses to stressful life events so that the parents learn to identify specific eliciting stimuli and

ongoing cognitive and behavioral responses to life events. The therapeutic task is to assist the parent in identifying patterns of covert and overt events that regularly precede, accompany, and follow stressful interactions. The parent is typically instructed to record the details of stressful interactions so that eliciting events and cognitive and behavioral responses to these events can be identified (it may be useful to keep a journal of these self-observations).<sup>30</sup> Usually, the parent also imagines these, or other potentially stressful situations, describing aloud his or her thoughts and reactions, so that relationships between cognitive and emotional responses can be identified.

2. Didactic instruction, modeling, and graduated practice are employed to teach parents alternate ways of coping with stressful situations. Usually parents are encouraged to employ signs of impending distress as a signal to engage in cognitive or behavioral strategies that are designed to alter the stressful interaction or to manage their emotional response. Strategies may primarily involve changes in behavior (eg, more assertive behavior or withdrawal from the situation) or changes in the parents' cognitive responses (eg, changes in interpretation or internal dialogue). These responses may be specific and for particular situations (eg, positively comparing own marriage to that of others) or they may be global and for a variety of situations (eg, meditation or relaxation responses). Although these strategies are initially suggested by the physician, the therapeutic goal is to enable the parent to develop effective problem solving skills for managing everyday life stresses without therapeutic assistance.

This approach to the prevention of recurrent childhood poisoning holds promise, for it is based on conceptual models that have proven effective in the treatment of other problems. Swidler and Walson<sup>31</sup> have already noted that interventions using behavioral techniques to handle hyperactive children are successful. These techniques can have significant effects on environmental stresses that may be associated with recurrent poisonings.

### References

1. Facts of Life and Death. In National Center for Health Statistics (Hyattsville, Md): DHEW publication No. (PHS) 79-1222. Government Printing Office, 1978, pp 33, 45
2. Murdock R, Eva J: Home accidents to children under 15 years: Survey of 910 cases. *Br Med J* 3:103, 1979
3. Calnan NW, Dale JW, Fonseka CP: Suspected poisoning in children. *Arch Dis Child* 51:180, 1976

4. Sobel R: Traditional safety measures and accidental poisoning in childhood. *Pediatrics* 44(suppl 5):811, 1969
5. Sobel R, Margolis JA: Repetitive poisoning in children: A psychosocial study. *Pediatrics* 35:641, 1965
6. Okasha B, Osman NM, Kamel M: A psychosocial study of accidental poisoning in Egyptian children. *Br J Psychiatry* 129:539, 1976
7. Sibert R: Stress in families of children who have ingested poisons. *Br Med J* 3:87, 1975
8. Kuzomko J: Accidental poisoning in children: The 'sick' family. *Practitioner* 214:813, 1975
9. Padilla ER: Predicting accident frequency in children. *Pediatrics* 58:223, 1976
10. Brown GW, Davidson S: Social class, psychiatric disorder of mother, and accidents to children. *Lancet* i:378, 1978
11. Ensen T: The potential usefulness of sensations of odor and taste in keeping children away from harmful substances. *Ann NY Acad Sci* 237:224, 1974
12. Temple AR, Stremming K: Taste as a deterrent in pediatric poisonings. *Clin Toxicol* 8:541, 1975
13. Rumack BH, Ford P, Sloarbaro J, et al: Regionalization of poison centers: A rational role model. *Clin Toxicol* 12:367, 1978
14. Temple AR: Testing of child-resistant containers. *Clin Toxicol* 12:357, 1978
15. McIntire MS: Safety packaging: A model for successful accident prevention. *Pediatr Ann* 6:706, 1977
16. Godwin RH: Child-resistant locks in poison control. *Pediatrics* 61:750, 1977
17. Lacouture P, Minisei M, Gouveia WA, et al: Evaluation of a community-based poison education program. *Clin Toxicol* 13:623, 1978
18. Craft AW, Sibert JR: Accidental poisoning in children. *Br J Hosp Med* 17:469, 1977
19. Mofenson HC, Greensher J: Poisonings—an update. *Clin Pediatr* 18:144, 1979
20. Bauman MH, Grace NT: Family process and family practice. *J Fam Pract* 4:1135, 1977
21. Bullock D, Thompson B: Guidelines for family interviewing and brief therapy by the family physician. *J Fam Pract* 9:837, 1979
22. Froom J, Culpepper L, Kirkwood CR, et al: An integrated medical record and data system for primary care. Part 4: Family information. *J Fam Pract* 5:265, 1977
23. Medalie JH: The family life cycle and its implications for family practice. *J Fam Pract* 9:47, 1979
24. Schmidt DD: The family as the unit of medical care. *J Fam Pract* 7:303, 1978
25. Smilkstein G: The cycle of family function: A conceptual model for family medicine. *J Fam Pract* 11:223, 1980
26. Whitehead WE, Federavizius AS, Blackwell B, et al: A behavioral conceptualization of psychosomatic illness: Psychosomatic symptoms as learned responses. In McNamara JR (ed): *Behavioral Approaches to Medicine: Application and Analysis*. New York, Plenum, 1979, pp 65-99
27. Hoebel FC: Brief family interactional therapy in the management of cardiac-related high-risk behaviors. *J Fam Pract* 3:613, 1976
28. Zeilbergen J, Sampen SE, Sloane HN: Modification of a child's problem behaviors in the home with the mother as therapist. *J Appl Behav Anal* 1:47, 1968
29. Holroyd KA: Stress coping and the treatment of stress-related illness. In McNamara (ed): *Behavioral Approaches to Medicine: Applications and Analysis*. New York, Plenum, 1979, pp 191-226
30. Shelton JL, Rosen GM: Self-monitoring by patients. In Rosen GM, Geyman JP, Layton RH (eds): *Behavioral Science in Family Practice*. New York, Appleton-Century-Crofts, 1980, pp 171-188
31. Swidler HJ, Walton PD: Hyperactivity: A current assessment. *J Fam Pract* 9:601, 1979

