

A logical extension was the use of drugs with immunosuppressive activity. Successful issues have been reported in lethal mid-line granuloma. In one case cyclophosphamide and steroids were combined (Greenspan, 1965), and in another intra-arterial infusion of methotrexate was used (von Leiden and Schiff, 1964). Dramatic improvement was obtained in a case of Wegener's granulomatosis treated with nitrogen mustard and chlorambucil (Hollander and Manning, 1967). A pronounced beneficial response occurred after azathioprine therapy in a patient with Wegener's granulomatosis in whom biopsy had shown renal involvement, and after a year's therapy normal renal function had been preserved. A repeat renal biopsy had shown reduced activity of the lesions, the nasal and pulmonary affection had responded in large measure, the originally high serum level of gammaglobulin had been reduced, and there was a reversal of the direct Coombs test to negative (Bouroncle, Smith, and Cuppage, 1967).

Azathioprine induced a prolonged remission in two patients with advanced Wegener's granulomatosis and renal insufficiency. Systemic symptoms responded, the pulmonary lesions regressed, the proteinuria was reduced, and progression of the renal failure was arrested, though the histological lesions were still evident on the examination of subsequent renal biopsy material (Kaplan, Hayslett, and Calabresi, 1968). It is of considerable significance that chemotherapy was instituted only after high doses of corticosteroids had failed to control progress of the disease. Duazomycin A, a glutamide antagonist, was given in combination with azathioprine but was thought to have played a minor part, and small doses of prednisone were continued, as there is evidence that exogenous corticosteroids may have beneficial properties for those receiving antimetabolites as immunosuppressive therapy (Adams, Gordon, and Maxwell, 1967).

Two patients with Wegener's granulomatosis whose prognosis seemed extremely poor obtained clinical remission lasting 12 and 17 months respectively on a combined regimen of corticosteroid and azathioprine therapy (Norton, Suki, and Strunk, 1968). Serial measurements of the glomerular filtration rate showed significant improvement of renal function; it was not possible to assign a role of primary importance to either drug alone or in combination, but in both patients serious side-effects

could be attributed to the use of high doses of corticosteroids. The extended period of survival of patients treated with anti-mitotic therapy is presented by Brown (1969); he considers that it is unjustifiable to withhold this form of treatment and that it is superior to corticosteroids alone.

The present patient showed a lack of response to corticosteroids, and, indeed, deterioration was obvious until azathioprine therapy was introduced. The beneficial effects on the patient's general condition, the total disappearance of the local lesions, and the response of the peripheral neuropathy all occurred soon after the start of azathioprine, and leave little doubt that this was the agent responsible for the remission. That this remission has endured for 15 months, even after discontinuance of this treatment, is striking. It may well be that this case represents a more benign example of this group of disorders; but the results afford encouragement for continued trials of this form of treatment and for combinations of various immunosuppressive agents in the more resistant varieties. The shortcomings of azathioprine alone are, however, evident in that inquiry regarding its current usage in Wegener's granulomatosis has revealed a beneficial effect in only one of three cases (B. Mornington, personal communication, 1968).

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Accidental Poisoning in Children in Uganda

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The incidence and mortality of accidental poisoning in children are very high in Britain (Craig and Fraser, 1953; Swinscow, 1953; Sweetnam, 1968) and in the United States (Nelson, 1966; Beeson and McDermott, 1967), and in many countries are increasing (Craig and Fraser, 1953; McKendrick, 1960; McDonald, 1961; Ingle *et al.*, 1966; Sweetnam, 1968). There is no published report from Uganda showing the nature and extent of accidental poisoning in childhood. This paper reports such findings from a retrospective study.

MATERIAL AND METHOD

The material for investigation was collected from the records of children admitted to the children's ward of New Mulago Hospital during a period of six years from January 1963 to December 1968. During this period 130 children were admitted with accidental poisoning; of these seven died. The total number of children admitted during the same period was 20,061. Thus children admitted for accidental poisoning

accounted for 0.65% of the total admission of children. On all but one occasion (an accidental injection) the poison was ingested either as therapeutic overdosage or as a true accidental poisoning. Cases of suspected poisoning were excluded, as were the three cases of snake-bite, three of bee-sting, and nine of dog-bite. There were no repeaters.

Many types of poison were found to have caused the accidents, and an attempt was therefore made to classify the poisons into four broad groups similar to those of Swinscow (1953).

Medicaments—meaning preparations prescribed for either internal or external use by medical personnel.

Household agents—meaning poisons used in homes and gardens—for example, rat poison, D.D.T., kerosene.

Food agents—meaning substances used as food or drink.

Miscellaneous—those substances that cannot be grouped in any of the above categories.

FINDINGS

The groups of poisons and their incidence are shown in Table I.

Medicaments were the second largest cause of accidents, being involved in 36.9% of the total cases, which included 29 therapeutic accidents and 19 true accidental poisonings. These

true accidental poisonings include four from aspirin; two each from diazepam, chloroquine, and unidentified tablets; and one case each from codeine, iron, De Witts tablets, quinine, amitriptyline, mepyramine, and dapsone. The whole medication group includes 10 cases of codeine, eight of chlorpromazine, six of aspirin, four of tetrachloroethylene, three of

TABLE I.—Type and Incidence of Poisoning

Group	No.	%
Medicaments	48	36.9
Household poisons	56	43.1
Kerosene	34	
Pesticides	20	
Others	2	
Food agents	24	18.5
Waragi (alcohol)	15	
Food-poisoning	4	
Mushroom-poisoning	4	
Cooking-oil	1	
Miscellaneous	2	1.5
Total	130	100

chloroquine (one by injection); two cases each of barbiturate, diazepam, and unidentified tablets; one case each of iron, De Witts tablets, quinine, amitriptyline, phenytoin (Epanutin), Thiazina (thiacetazone combined with isoniazid), paregoric, dapsone, digitalis, mepyramine, and chloral hydrate. Codeine and chlorpromazine are used in this hospital for cough and gastroenteritis respectively—the latter for its anti-emetic properties. The mothers gave an overdose on the misconception that if little would do, much was obviously better.

Household agents caused 56 (43.1%) cases, the largest group in the series. The most important agent was kerosene, which accounted for 34 out of the 56 cases. There were 20 cases of pesticides, which included six from rat poison, six of diazinon, five of DDT, and one each of organic phosphorus, dieldrin, and turpentine. The remaining two cases were one of diesel oil and one of paint.

Food agents accounted for the third largest cause with 24 (18.5%) cases, 15 of which were due to waragi (a local alcoholic drink distilled in the homes and also commercially), four to food-poisoning, four to mushroom, and one to cooking-oil.

Miscellaneous Causes.—Two children took an overdosage of native medicine.

Age and Sex.—Table II shows that the 1–2 age group had the highest incidence (36.2%) of poisonings, and that most (93.1%) cases occurred in children under 5 years. As a matter of fact, kerosene caused 33 out of 35 cases under 2 years, and waragi 13 out of 15 over 2 years. There were 58% males and 42% females in the series.

TABLE II.—Age Distribution of Poisoned Children

Age (Years)	No.	%
< 1	26	20.0
1–	47	36.2
2–	19	14.6
3–	14	10.8
4–	15	11.5
5+	9	6.9
Total	130	100

Mortality.—There were seven deaths—a mortality of 5.4%. Five of the deaths occurred in boys. The seven deaths were due, one case each, to dapsone, waragi, codeine, chlorpromazine, Thiazina, aspirin, and chloroquine (by injection); except for the one caused by waragi all were due to drugs. All the deaths occurred in children under 4 years of age.

DISCUSSION

Accidental poisoning accounted for 0.65% of all children's admissions. This is a small figure indeed, but it has to be weighed against parental anxiety, expense, and bed-blockage. The mortality rate of 5.4% is more than 10 times that of 0.45% from a pooled series of American workers (McKendrick, 1960). This high rate probably reflects the severity of the cases.

Most (81.5%) of the children were under 5. Craig and Fraser (1953) found 89.4% to be under that age. The highest incidence was in the 1–2-year age group. This is in agreement with McDonald's (1961) findings. There were 58% males and 42% females. This male-to-female preponderance has been documented (Beeson and McDermott, 1967).

With the exception of a drop in incidence in 1965, Table III shows a rising trend which has been observed by others. The rise was especially significant during 1967 and 1968, when the incidence was 23.1 and 21.5% respectively, being almost double that in 1963. This increase was probably due to a rise in prevalence of accidental poisoning. It may also be due in part to improved parental understanding of the danger associated with accidental poisoning, or perhaps to increased referral to the casualty department.

TABLE III.—Yearly Incidence of Poisoning

Year	No.	%
1963	18	13.8
1964	21	16.2
1965	14	10.8
1966	19	14.6
1967	30	23.1
1968	28	21.5
Total	130	100

Kerosene was the most important of the poisons concerned, followed by waragi. Musoke (1961) found 15 cases of accidental poisoning admitted to Old Mulago Hospital in 1959. Of these 11 were due to kerosene and two to waragi. Kerosene, then, is the commonest cause of accidental poisoning in this community. This is true also in Johannesburg (McDonald, 1961), where kerosene is used as a cooking fuel by Africans. It is interesting to note that drugs as a group came second in this series, and that two of them—codeine and chlorpromazine—caused most of the therapeutic accidental poisonings. Aspirin poisoning, which is common in the United States, caused six accidents with one death, and ferrous sulphate, common in the United Kingdom, only one accidental case in six years.

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