PESTICIDE POISONING

IN SRI LANKA

Pesticide Poisoning in Sri Lanka

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We reproduce here extracts from a study published in the WHO Bulletin in 1982. This study included a sample survey of the clinical records of patients admitted to the different hospitals in Sri Lanka, and showed that approximately 13,000 patients are admitted to hospital annually for pesticide poisoning and that each year 1,000 of them die. Suicidal attempts account for 73% of the total and occupational and accidental poisoning account for 24.9%. It recommended that urgent action be taken to minimise the extent of the problem.

The present study was undertaken to investigate the overall extent and characteristics of the problem of pesticide poisoning in Sri Lanka in order that appropriate action could be taken to minimize the problem.

In the study, data on the number of patients admitted to government hospitals for pesticide poisoning were obtained from the central statistical unit of the Department of Health, and provided an overview of the extent of the problem. However, it was necessary to undertake a national sample survey in order to understand better the problem of pesticide poisoning in Sri Lanka. The survey was undertaken between March and June 1981.

The records of the Medical Statistical Unit, Department of Health, Sri Lanka show that in the period 1975–80 an average of approximately 13,000 patients were admitted annually to government hospitals for treatment of acute pesticide poisoning and that approximately 1,000 of these patients died each year (Table 1).

Table 1
Hospital admissions in Sri Lanka for Pesticide poisoning

Year	No.of deaths	No.of patients
1975	14,653	938
1976	13,778	964
1977	13,648	1,042
1978	14,699	982
1979	11,372	1,045
1980	11,811	1,112

Analysis of the cause of poisoning is shown in Table 2. The data show that suicide and occupational exposure were the two most common causes of poisoning, the former particularly among women. On the basis of these figures it can be estimated that 1,046 deaths occurred in 1979 due to occupational and accidental exposure. The type of pesticide responsible for poisoning and the respective case fatality percentages are shown in Table 3. A relatively large proportion (15.9%) of the clinical records had no information as to the name or type of pesticide. The organophosphorus compounds were responsible for most (76%) of the poisonings. The case fatality rate was highest (33.3%) among patients poisoned by a mixture of organophosphorus and organochlorine compounds and was 28.5% in those patients for whom no information as regards type of pesticide was available. The overall case fatality rate in this series was 22.4%

Discussion

The only previous data showing a national morbidity rate as high as 76 cases/ 100,000 population were those published by Zegarski et al. * for Poland in 1968, although it is possible that in other predominantly agricultural countries of the Third World the figures will be equally high. In Sri Lanka in 1978, where over 1,000 deaths were due to pesticide poisoning, there was a total of only 572 deaths due to poliomyelitis, diptheira, tetanus, and whooping cough, and malaria did not result in a single death. In spite of the extent of the problem of pesticide poisoning, it has for a variety of reasons so far not been highlighted.

Analysis of the epidemiological data by health service area indicates a wide range in the morbidity rates in the different areas. Agriculture is the main occupation in the areas with the highest rates (Batticaloa, Va-

vuniya and Jaffna) where the cash crops (vegetables, tobacco, onions, and chillies) and paddy require extensive use of pesticides. Such areas clearly require urgent and priority action to minimize the extent of the problem. In contrast the areas with the lowest rates were those where agriculture is not a major occupation or where rubber or coconuts are the main crops.

On the basis of the observation that 24.8% of cases in the sample surveyed were caused by occupational or accidental exposure to pesticides, it can be estimated that in 1979, 2,820 patients were admitted to hospital

The high mortality of cases due to mixtures of organophosphates and organochlorines is an indication of the therapeutic difficulties of managing patients poisoned with pesticide preparations containing such mixtures. The situation could be avoided if manufacturers were to agree not to market such mixtures of pesticides. The high case fatality rate of 28.5% recorded among patients whose clinical records did not show the type of pesticide indicates problems of therapy when full information is not available to the physician. The great variety of trade names of pesticides often creates problems for the physician, as he is unable to classify the pesticide and thus to institute appropriate therapy. To lessen this problem, Lionel published a list of all pesticides available in Sri Lanka, ** indicating the class to which they belong.

Table 2. Causes of Poisoning

Cause of poisoning	Males		Females		Sex not specified		Total	
	No.	%	No.	%	No.	%	No.	%
Suicide	494	66.3	260	90.6	2	0.2	756	73.1
Occupational	170	22.8	7	2.4	–	–	177	17.1
Accidental	64	8.6	16	5.6	–	–	80	7.7
No information	17	2.3	4	1.4	–	–	21	2.1
Total	745	100.0	287	100.0	2	–	1,034	100.0

The health service areas with high morbidity rates seem to have somewhat lower case fatality rates, probably because the hospitals and staff in these areas are better equipped to manage the frequent cases of pesticide poisoning. The extremely high case fatality rate (50%) recorded for the Ratnapura area in 1979 is inexplicable, as the case fatality rates for the years 1978 and 1980, though higher than the national average, were well below that figure.

It was observed in the present study that suicides were the commonest cause of poisoning (73%) among both males and females. A similar pattern was also observed in Malaysia, where almost 82% of all cases of poisoning admitted to hospitals were attempted suicides. In the present study, though 90.6% of poisoning among females were suicidal attempts, it cannot be interpreted that this indicates that females in Sri Lanka are more prone to suicide. In the study series, only 27.8% of poisonings were among females whereas nationally females constitute 48% of the total population. Senewiratne and Thambapillai have previously observed that suicides and suicide rates are in fact higher among males in Sri Lanka.

for this reason. Assuming that all the occupational and accidental poisonings occurred among the 472,435 agricultural workers in Sri Lanka, it would appear that 5 of every 1,000 of the agricultural workers are hospitalized annually for pesticide poisoning. However, this must be an under-representation of the true state of affairs for two reasons. Firstly, the rate refers to all agricultural workers, whereas the majority are plantation workers among whom poisoning by pesticide is relatively uncommon. Secondly, since the series referes only to poisoning that required hospitalization, the total number of poisoning episodes must be much greater than this figure.

The present study demonstrates the fact that the problems of acute pesticide poisoning in Sri Lanka and possibly also in other developing countries seem to be of greater severity than those in the developed nations. This difference implies that the approach of developing countries to the control of health-related problems due to pesticides must be different from that of the industrialized nations. Every effort must be made to reduce the number of cases of acute pesticide poisoning, leaving the developed countries to direct their scientific efforts to identifying unknown or long-term problems associated with pesticides.

* *Zegarski, W.et.al. Acute intoxications. A medical and social problem. Pesticide abstracts, 605–606 (1977)*

** *Lionel N.D. Poisoning by agrochemicals. The Prescriber 6:1–28 (1978)*

Type of pesticide and case fatality rate

Type of pesticide	Cases		Deaths		Case fatality rate
	No.	%	No.	%	
Organophosphorus compounds	786	76.0	171	73.7	21.8
Organochlorine compounds	42	4.1	6	2.6	14.1
Carbamates	14	1.4	1	0.4	7.1
Organophosphorus and organochlorine compounds	21	2.0	7	3.0	33.3
Organophosphorus compounds and pyrethrins	3	0.3	nil	–	0.0
Pyrethrins	3	0.3	nil	–	0.0
No information	165	15.9	47	20.3	28.5
Total	1,034	100.0	232	100.0	22.4

Although 73.0% of the cases of pesticide poisoning in Sri Lanka were due to suicide, it must be conceded that the control of suicide is difficult and requires action related to the many aspects influencing its occurrence. In contrast, although the proportion of cases resulting from occupational or accidental causes was 24.8%, these could be considered more important since they are more readily preventable. For this, it is necessary that preventive measures be centred around educating users about safe pesticides in nationally relevant terms and that an effective national system of control of pesticides be developed. Such a programme must necessarily involve the ministries of Health and Agriculture, representatives of the workers, and the companies that manufacture and sell pesticides.