What are the common pesticides presenting as acute poisoning in Bangladesh?

Dr. Sabbiha Nadia Majumder, Dr. Md Robed Amin, Dr. Fazle Rabbi Chowdhury, Dr. Ariful Basher, Dr. Md. Rafiqul Islam

Introduction

- In Bangladesh acute pesticide poisoning from deliberate self harm and less commonly from accidental and occupational exposure is accountable for deaths and poses immense strain on hospital services following the widespread availability of agro-chemicals.

- Pesticides are broadly divided into two types: OP and non OP. They have different modes of action hence management is different.

Introduction

- A large number of pesticide poisoning cases is being treated inappropriately due to inadequate information regarding the substance taken by the patient and lack of awareness at community level.

- In this study, we try to figure out the sample of pesticide taken by the patient using different modalities and also try to find the short term hospital outcome .

Objectives

- General: To observe the brought specimen or container of pesticide for identification of specific pesticide agent in acute pesticide poisoning in a tertiary care center in Bangladesh.

- Secondary:

a. To identify insecticides, herbicides, acaricides, fungicides, rodenticides among pesticide poisoning cases.

b. To correlate clinical toxidrome with different pesticide groups.

Rationale: early detection of pesticide by brought specimen or bottles for judicious use of antidote and other treatment option

Methodology

- Study design: Cross sectional hospital based observational study.
- Study site: All adult medicine units of Dhaka Medical College Hospital
- Study population: Patients (> 14 years) with features of pesticide poisoning.
- Study period : 9 months from 1.06.2017 to 28.02.2018
- Sample size :384
- Report : This is an interim report

The study has been funded by *Syngenta Bangladesh Limited*

Methodology

- Subject selection:

Inclusion criteria:

a. All patients admitted in the medicine department of DMCH with features of pesticide poisoning. It will be diagnosed by clinical toxidrome of poisoning (eg frequently cholinergic toxidrome will be searched for diagnosing clinical OP poisoning) and is confirmed by brought specimen/ bottles of pesticides or photographs.

b. Patients with history of acute pesticide poisoning without any clinical features but the agent is confirmed through brought specimen or photographs.

Methodology

Exclusion criteria:

a. Agents confirmed as non pesticide through brought specimen or bottles or photograph will be excluded.

b. Participants or attending bystanders not giving written informed consent will be excluded.

Methodology

- Study procedure:

1. approved by Ethical review committee of DMCH.
2. Patient and patient's attendants were asked to bring the sample either in the form of container or picture using various modalities like viber, email, imo, facebook, messenger etc
3. Only the patients who were able to provide the sample were enrolled.
4. Details of clinical presentation, social background were recorded in the printed case record form by specially trained medically qualified research associate. The cases were also offered informed written consent.

Methodology

5. The specimen brought were observed for labeling, manufactured agency, brand name and trade name . The labelled bottle or specimen were rechecked through list of registered agricultural and public health pesticide in Bangladesh prepared by Plant protection wing of department of Agricultural extension, Khamarbari, Dhaka-1215 and courtesy by Bangladesh Crop Protection Association (15th Nov,2008) and were recorded accordingly.

6. The agents were subclassified as insecticides, herbicides, acaricides, fungicides, rodenticides.

7. All the brought specimen were stored in a room of department of medicine, DMCH.

8. Doubtful sample was reconfirmed by Plant protection wing of department of Agricultural extension, Khamarbari, Dhaka-1215.

Result


মর্টার ৪৮ ইসি
প্রতি লিটার মর্টার ৪৮ ইসিতে ৪৮০ গ্রাম সক্রিয় ক্লোরপাইরিফস আছে
বাংলাদেশে একমাত্র পরিবেশক :
ন্যাশনাল এগ্রিকেয়ার ইমপোর্ট এন্ড এক্সপোর্ট লিঃ


হাইফানন-৫৭ ইসি
প্রতি লিটারে ৫৭০ গ্রাম ম্যালাথিয়ন আছে
গৌরব ইন্ডাষ্ট্রিজ লিমিটেড

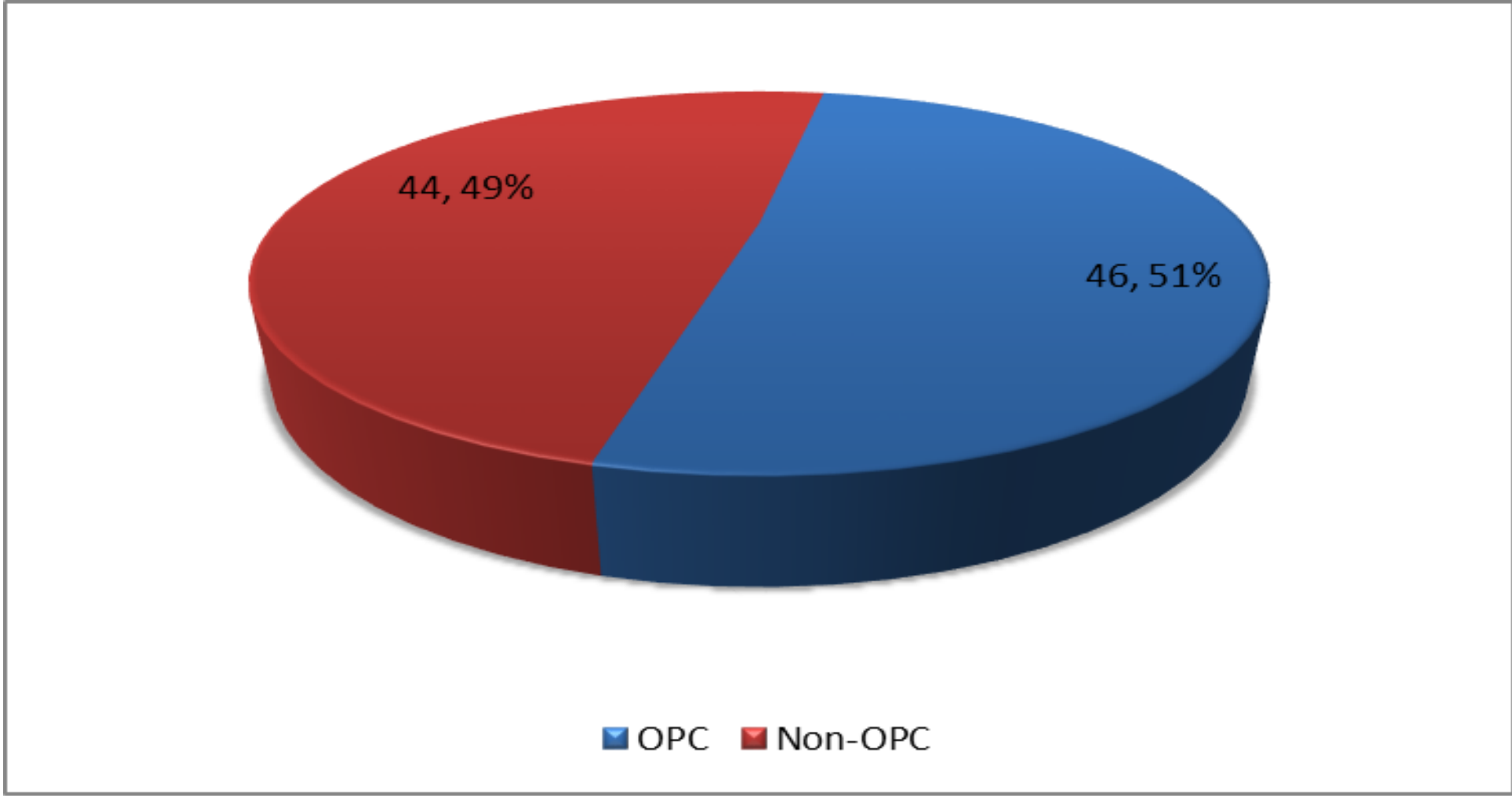

টোপাস -৫৭ ইসি
ম্যালাথিয়ন
৫০ মিলি
প্রতি লিটারে ৫৭০ গ্রাম ম্যালাথিয়ন আছে
বাংলাদেশে একমাত্র পরিবেশক :
সান কর্পোরেশন


Limit
এল ফস ৪৮ ইসি
প্রতি লিটারে ৪৮০ গ্রাম সক্রিয় ক্লোরপারিইফস বিদ্যমান
৫০ মি.লি.

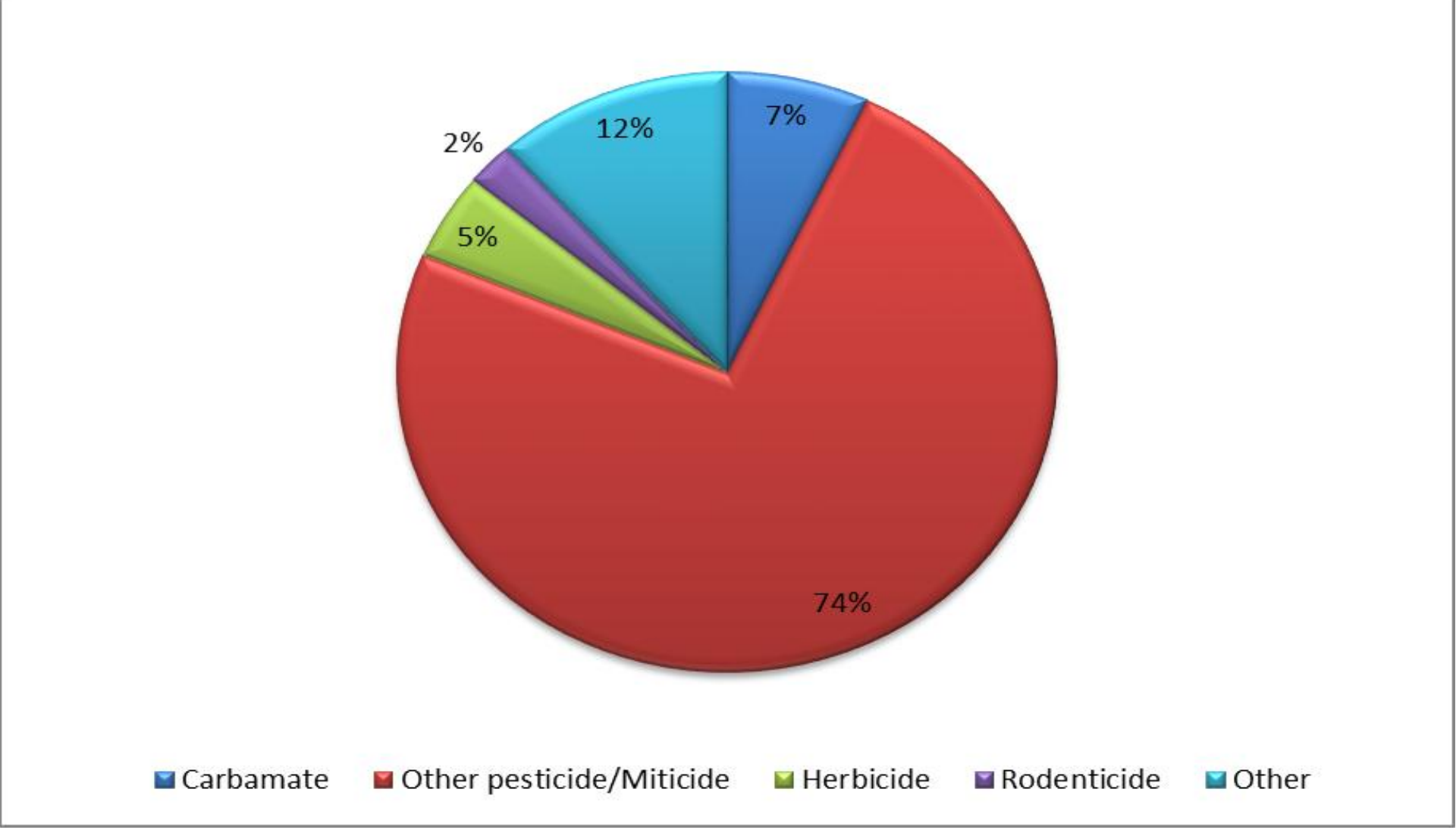

প্যাডি ২০ এসএল
প্রতি লিটার প্যাডিতে ২৭৬ গ্রাম প্যারাকোয়াট ডাইক্লোরাইড আছে
প্যাডি ২০ এসএল স্পর্শক, তাৎক্ষনিকভাবে ক্রিয়াশীল একটি অনিবাচিত আপাছানাশক
আমদানি ও বাজারজাতকারক :
MARSHAL Agrovet Chemical Industries Limited
মার্শাল এগ্রোভেট কেমিক্যাল ইন্ডাষ্ট্রিজ লিমিটেড


VoliamFlexi

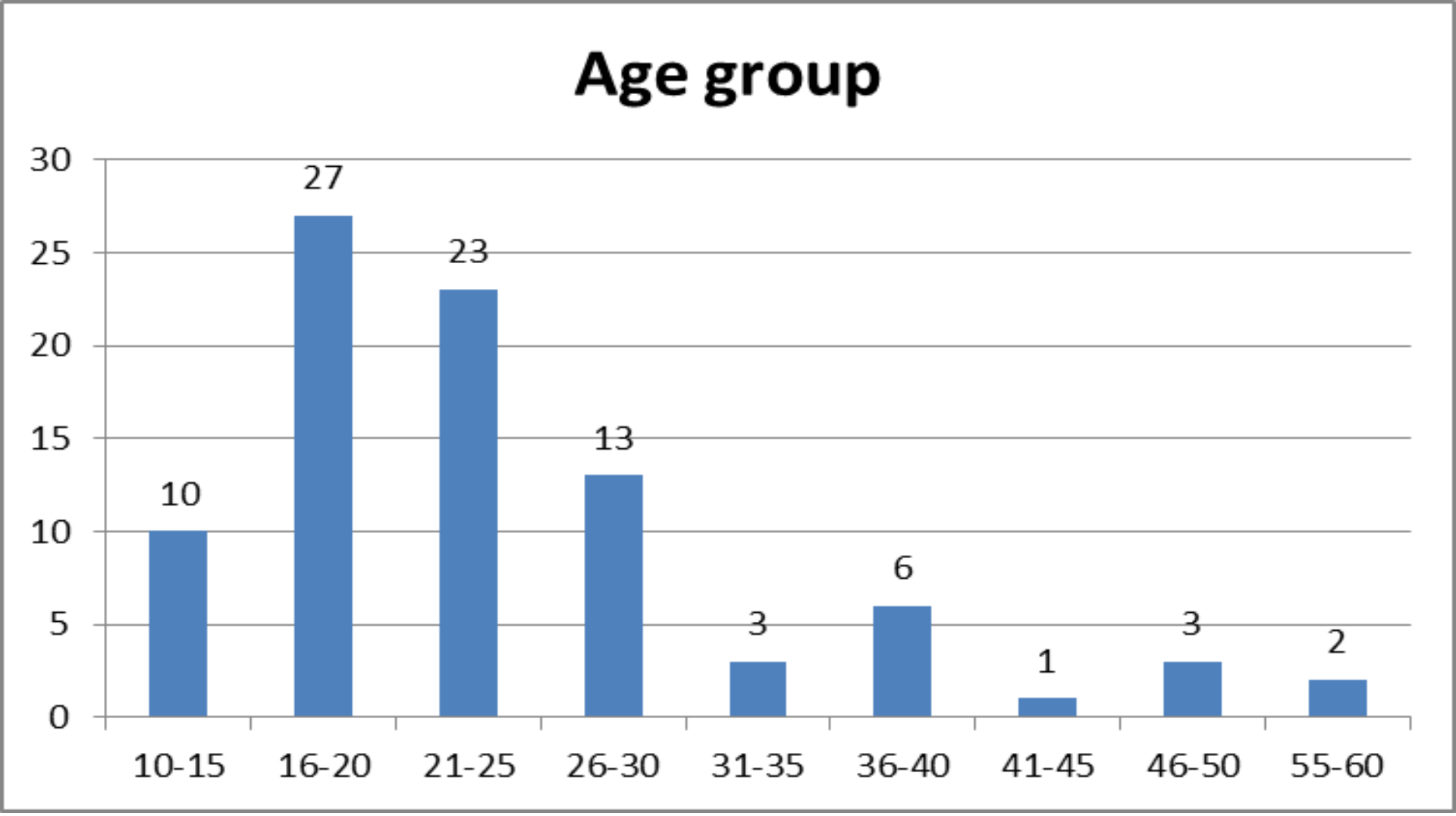

ফুরাডান
দানাদার কীটনাশক / নিমাটোডনাশক ৫জি
90
105
68



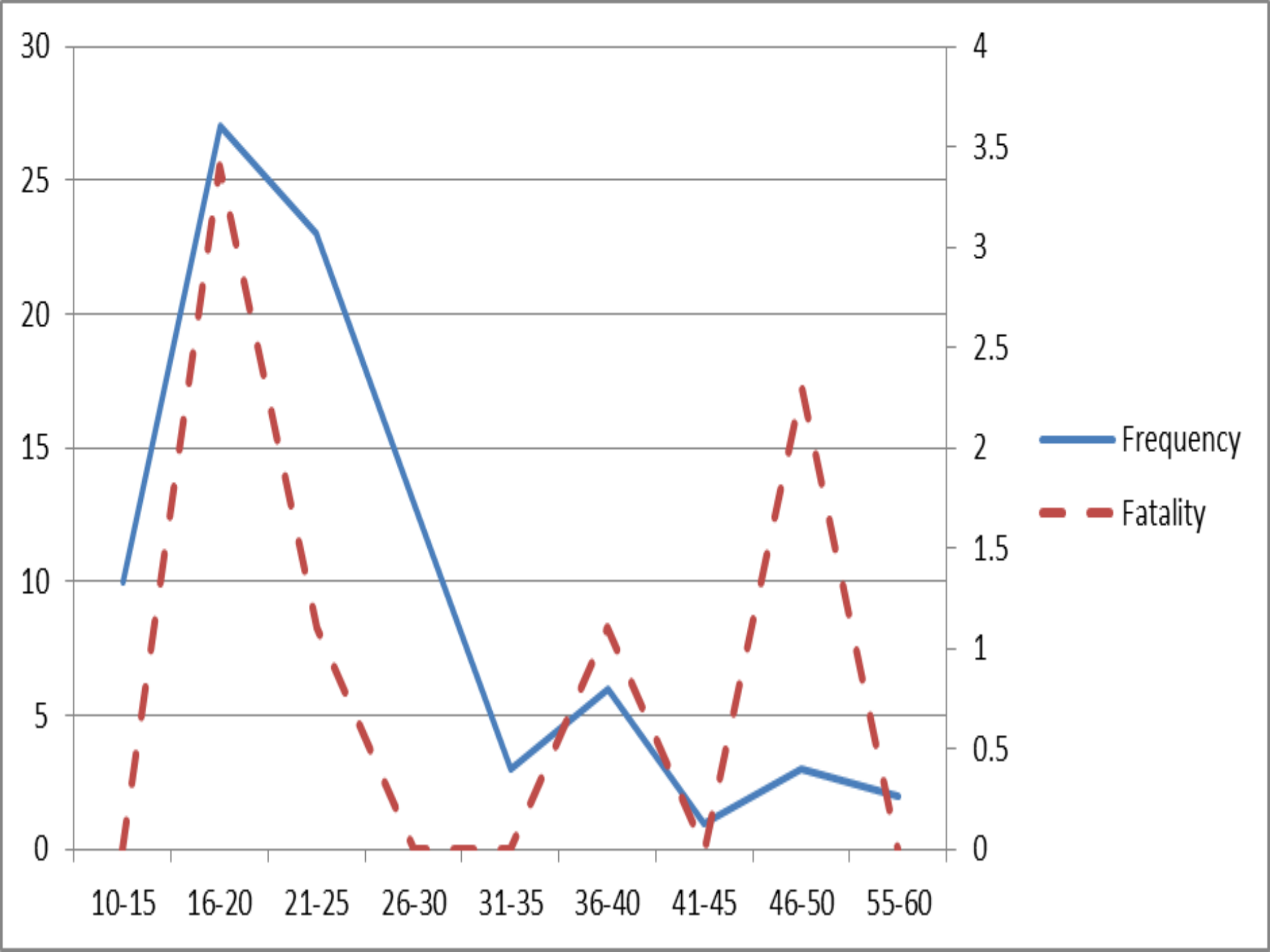
Distribution of patients according to type of poiso taken



Distribution of non op cases



Age group distribution of patients


30
25
20
15
10
5
0
4
3.5
3
2.5
2
1.5
1
0.5
0
10-15
16-20
21-25
26-30
31-35
36-40
41-45
46-50
55-60
Frequency
Fatality

Variable	Total/Missing data	Of All		Survivors		Deaths		Mortality		
	89/1	N	%	N	%	N	%			
OP		46	51.7%	41	89.1%	*5*	10.9%	5.6%		
Carbamate		3	3.4%	3	100%	0	0	0		
Other pesticide/Miticide		32	36.0%	32	100%	0	0	0		
Herbicide		2	2.2%	1	50%	1	50%	1.1%		
Rodenticide		1	1.1%	1	100%	0	0	0		
Other		5	5.6%	4	80%	1	20%	1.1%		

There were 7 death reported in this series with highest from OP group (5 cases).

Variable	Total/Missing data	Category	Proportion of deaths	Of All		Survivors		Deaths		Odds ratio	95% CI	P value
Cause	88/2			N	%	N	%	N	%			
Suicidal		Family Disharmony	83.3%	39	49.4%	34	87.2%	5	12.8%	0.73	0.08-6.67	0.78
		Fail to Pass Exam	0	2	2.5%	2	100%	0	0			
		Economic Loss	0	3	3.8%	3	100%	0	0			
		Others	16.7%	35	44.3%	34	97.1%	1	2.9%			
Accidental			0	7	8.0%	7	100%	0	0	NA		
Others			14.3%	1	1.1%	0	0	1	100%	NA		

Ninety two percent were suicidal while rest are accidental and homicidal.

Variable	Total/Missing data	Category	Proportion of deaths	Of All		Survivors		Deaths		Odds ratio	95% CI	P value
				N	%	N	%	N	%			
Glasgow coma score	90/0	<9	57.1%	8	8.9%	4	50%	4	50%	26	4.38-159.74	***<0.001***
Blood pressure	90/0	Systolic <80	14.3%	4	4.4%	3	75%	1	25%	4.44	0.39-49.50	0.225
		Diastolic <60	28.6%	9	10%	7	77.8%	2	22.2%	4.34	0.71-26.63	0.112
Heart rate	90/0	>100	0%	12	13.3%	10	100%	0	0%	NA		
		<60	0%	2	2.2%	2	100%	0	0%	NA		
Pupil	82/8	Abnormal	85.7%	44	53.7%	28	86.4%	6	13.6%	5.84	0.67-50.90	0.110
		Dilated	14.3%	12	14.6%	11	91.7%	1	8.3%	1.09	0.12-9.94	0.938
		Constricted	71.4%	32	39%	27	84.4%	5	15.6%	6.85	0.76-62.06	***0.058***
		Pinpoint	14.3%	6	6.7%	5	83.3%	1	16.7%	2.60	0.26-25.98	0.416

A GCS<9 and pupilary constriction at admission was found to have correlated with poor outcome in this study.

The vital signs (pulse, blood pressure) were not founded to be correlated with poor outcome.

Discussion

- In this interim report, poisoning in male outnumbered female. Among males, most of them belonged to the age group of 15-25 years as younger people were predictably more vulnerable to impulsive act due to acute stress reaction.
- Most of the cases were suicidal (92%).
- Most of them were from primary education group (60%) and rest were illiterate (40%).
- There was no significant preponderance to any religious community.
- Poisoning was common in married people

Discussion

- People from rural setting were more prone to self harm
- It was found that OPCs were the most common pesticide used for deliberate self harm. The second most commonly used agent was pyrithroid compound.
- Fatality rate among op group was more (10.9%) than non-op
- The cardinal feature of poisoning were nausea and vomiting
- The case fatality was consistent with lower GCS at presentation.

Conclusion

- In this report it was revealed that op and non op cases were almost equal.
- It is imperative to identify who might be benefitted from an antidote and who are susceptible to develop both short and long term complication.
- Unfortunately , most of the non op cases got the treatment in the line of op poisoning. Sometimes this overwhelmed treatment brings unexpected consequence to the patients.
- For the physician, bringing sample could help to identify the proper agent responsible for poisoning and formulate appropriate treatment.

Recommendation

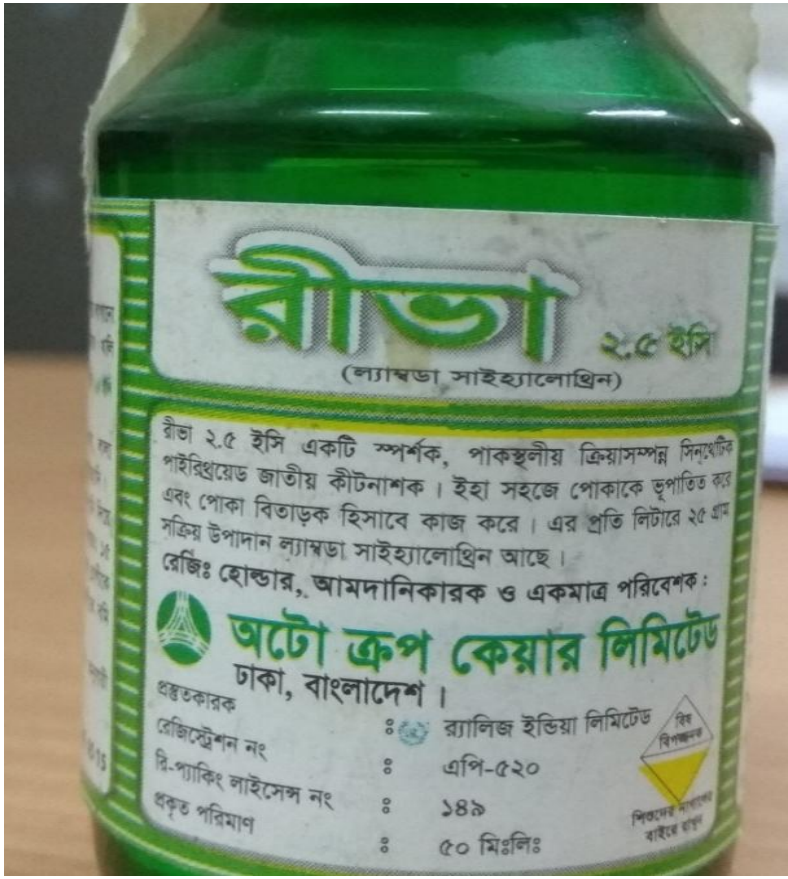
- Training of the health care providers should be intensified across the country – primary to tertiary care level.
- It should be tried to replace the most toxic pesticides with less harmful products.
- evidence based guidelines for case management is needed

My Experiences…

- In a corridor of DMCH, a case of pesticide poisoning was found. ….

- I started taking the history and convinced them to provide me the sample…they did …

- The patient was being treated with atropine , afterwards he was sent to ICU due to atropine toxicity and stayed for 3 days over there.

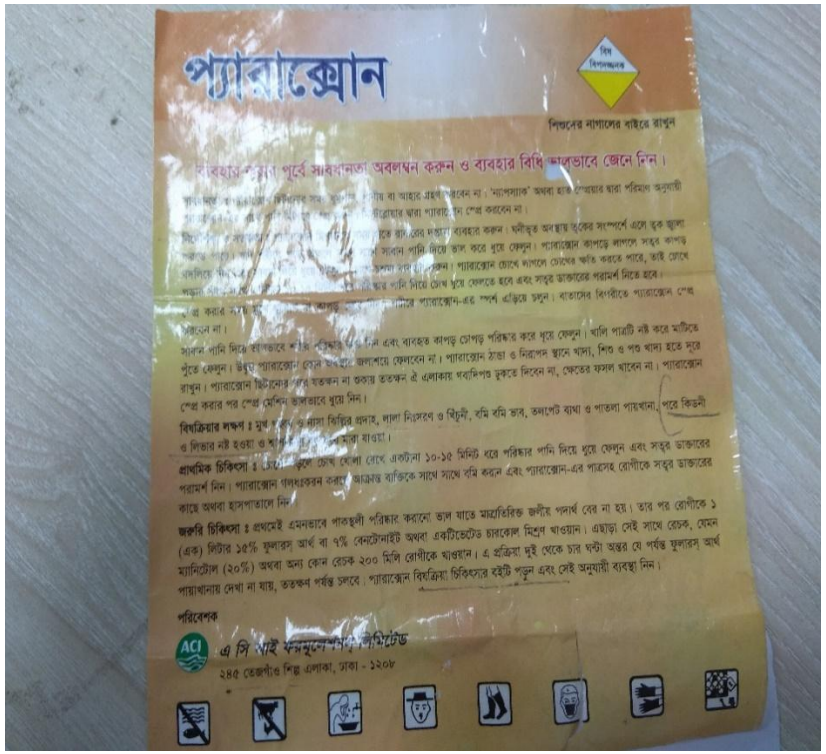


- In a emergency department of a tertiary care private hospital ….

a case of poisoning came with bradycardia and low blood pressure. . he brought the sample with him and showed me …

He also showed it to the treating consultant.

The patient was given injection atropine repeatedly to combat bradycardia ….



Take home massage

- Poisoning is a neglected health issue and less commonly discussed topic in medical education in Bangladesh.
- We have to face a good number of poisoned patients in our everyday clinical practice.
- Bringing the sample of consumed pesticide may sound unscientific but on practical ground it is justified.
- Awareness among doctors, nurses, paramedics is of paramount importance to prevent mishandling of the cases.

Acknowledgement

- All the medical personnel (doctors, nursing stuffs) , word boys of medicine departments of Dhaka medical college hospitals

- Patients and their attendants for their support

- TSB.