

Effects of Kalapather Poisoning on CPK, LDH, Blood Pressure and Heart Rate in Children

Effects of
Kalapather
Poisoning

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ABSTRACT

Objective: To study the Effects of Kalapather Poisoning on CPK, LDH, Blood Pressure and Heart Rate in Children.

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at the ICU children hospital Lahore during Jan 2014 to Dec 2019.

Materials and Methods: It was retrospective study. Sample size was 52. It was carried out in ICU of Children Hospital Lahore. SPSS version 25 was used for statistical analysis. Descriptive data and person correlation coefficient were measured. Informed written consent of parents was taken before start of study. The permission of Ethical Committee was considered before start of study and get published in Medical Journal.

Results: Mean values of CPK, LDH, heart rate, systolic blood pressure and diastolic blood pressure were much increased as compared to normal. CPK showed statistically significant and positive correlation with systolic and diastolic blood pressure.

Conclusion: Phenylenediamine PPD poisoning causes severe derangements in all systems of body in children. Blood pressure and heart rate increases along with CPK and LDH values yet if proper measure are taken timely then mortality may be reduced to minimum.

Key Words: CPK (creatine phosphokinase), LDH (Lactate Dehydrogenase), PPD (p-Phenylenediamine)

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INTRODUCTION

Manner of poisoning in children is predominantly accidental¹. Accidental poisoning is a major cause of accidental hurts that take place in children which may cause loss of life or damage to body leading to disability. More than 50% total cases which attend poisoning emergency centers belong to accidental poisoning in few countries². Various studies carried out in different countries of the world clearly indicate that accidental poisoning is more in male gender as compared to females.

This is due to the fact that males are more agile than females. Children with less than six years of age more come across the accidental poisoning³. Different studies carried out to know the various reasons leading to accidental poisoning show that various elements like,

how many are members of family, poverty, education, care of children and keeping the poisons and drugs separately are major facets influencing the occurrence of poisoning from things commonly used in houses like hair dye^{4,5}. Kala Pathar (black stone) is a low-cost and readily available hair dye in Pakistan. Its chemical ingredient PPD is a toxic and lethal substance when ingested^{6,7}. After ingestion, PPD causes edema of face, neck, tongue, pharynx and larynx. Its poisoning also causes angioneurotic edema, rhabdomyolysis and renal failure^{8,9}. Serum bilirubin, SGPT, SGOT, and serum alkaline phosphatase serum creatinine and CPK raised in its poisoning^{10,11}.

MATERIALS AND METHODS

Sample Size: Fifty two patients of kala pather poisoning

Inclusion Criteria: Any children with history of poisoning of kalapather regardless of age, sex, socioeconomic condition and whose parents consented to take part in the study were included in the study.

Exclusion Criteria: Children with known heart disease were excluded from study.

This retrospective study was conducted on 52 patients of PPD (hair dye) poisoning, hospitalized in the Intensive Care Unit of children hospital Lahore during Jan 2014 to Dec 2019. Age, gender and body weight were recorded. History was taken. Heart rate, systolic and diastolic blood pressure was recorded. Physical

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examination was performed. Blood was taken for measuring serum levels of CPK and LDH. Intubation, tracheostomy was performed where needed. Ventilators were provided to save life when required.

Statistical Analysis: It was performed by SPSS version 25. Descriptive data of age, weight, sex, CPK, LDH, heart rate, systolic and diastolic blood pressure was measured. Graphs and table were made. Pearson correlation coefficient was measured between cardiac enzymes and blood pressure and heart rate.

RESULTS

Mean values of CPK, LDH, heart rate, systolic blood pressure and diastolic blood pressure were much increased as compared to normal. CPK showed statistically significant and positive correlation with systolic and diastolic blood pressure.

Table No. 1: Descriptive data of age, weight, sex, CPK, LDH, heart rate, systolic and diastolic blood pressure

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	52	2.00	8.00	4.7196	1.57440
CPK	52	243.00	9175.00	1452.4231	2153.52173
LDH	52	432.00	8671.00	1296.8077	1586.30653
Heart_Rate	52	121.00	190.00	144.8462	15.68987
BP_systolic	52	55.00	123.00	85.4231	17.24148
BP_diastolic	52	38.00	90.00	55.0000	9.57939

Table No. 2: Correlation between LDH and heart rate, systolic blood pressure and diastolic blood pressure LDH

	Pearson correlation coefficient value	Value of p
Heart rate	0.294	0.035
Systolic blood pressure	0.07	0.602
Diastolic blood pressure	-0.03	0.834

Table No. 3: Correlation between CPK and heart rate, systolic blood pressure and diastolic blood pressure CPK

	Pearson correlation coefficient value	Value of p
Heart rate	0.260	0.063
Systolic blood pressure	0.561	0.000
Diastolic blood pressure	0.550	0.000

Table No. 4: Correlation between CPK and LDH

Correlations			
		LDH	CPK
LDH	Pearson Correlation	1	.590**
	Sig. (2-tailed)		.000
	N	52	52
CPK	Pearson Correlation	.590**	1
	Sig. (2-tailed)	.000	
	N	52	52

DISCUSSION

In this study effects of kalapather poisoning on CPK, LDH, blood pressure and heart rate were studied. Correlation between all these variables was done on SPSS 25 version. 34 needed inotropes and only one patient developed arrhythmia which led to his death. Mortality was 1.9% only. Minimum heart rate noted was 121/min and maximum heart rate was 190/min. Minimum systolic blood pressure was 55 and maximum was 123 mm of Hg. Similarly minimum diastolic blood pressure was 38 and maximum was 90 mm of Hg. There was no statistically significant correlation between CPK and heart rate. But there was statistically positive and significant correlation between CPK and systolic as well as diastolic blood pressure. In case of LDH and heart rate there was weak correlation with value of r equal to 0.294. LDH did not give any significant correlation with systolic as well as diastolic blood pressure. In a study carried out in Nawab Shah¹² it was found that mean value of CPK was 28.43 mg/dl while in this study minimum value of CPK was 243 mg/dl and maximum value was 9175 mg/dl. 37.63 U/L was maximum value of CPK in a study in India¹³. But those for adults and this study was carried out in children. In another study it was found that tracheostomy was essential to save life of patient¹⁴. In another study in South India it was found that 92% patients had elevated levels of CPK¹⁵. In a study values of CPK and LDH were 3700 and 1854 U respectively¹⁶. 32.84 IU/L was measured as a mean value in a study in Karachi¹⁷. In this study values of CPK and LDH were drastically elevated yet mortality was very low. Only one death took place that developed arrhythmias.

CONCLUSION

Phenylenediamine PPD poisoning causes severe derangements in all systems of body in children. Blood pressure and heart rate increases along with CPK and LDH values yet if proper measure are taken timely then mortality may be reduced to minimum.

Author's Contribution:

Concept & Design of Study: Mohammad Sarwar, Nighat Sultana
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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