PARAQUAT POISONING IN CHILDREN – A CASE REPORT

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ABSTRACT

Accidental poisoning in children is a serious public health problem in developing countries, especially where chemicals used in agriculture are ingested. Paraquat is a herbicide which is still used in Pakistan. We report a case of fatal unintentional paraquat ingestion by 3 years old child who could not survive. Lack of care in the storage of paraquat lead to the poisoning but initial inappropriate management was also one factor in the fatal outcome. Detailed history and provision of poison containers are important in the proper management of patients with poisoning.

KEYWORDS: *Poisoning, Paraquat, Children, Fatal, Herbicide*

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INTRODUCTION

Paraquat was introduced in agriculture in 1962 and since then due to poisoning either accidental or intentional, thousands of deaths had taken place.[1] It is one of the most lethal poisons leading to death if taken in an oral dose of 30 mg/ kg due to multi-organ failure. The main organ damaged by it is the lungs, in which there is infiltration of alveolar and interstitial spaces, oedema, hemorrhage and disruption of alveolar cells. Dose as low as 16 mg/kg can also lead to death in several days with progressive lung fibrosis.[2,3] Though paraquat has been banned in some countries yet it is still in use in Pakistan. Paraquat is rapidly absorbed and distributed to many organs including the lungs, liver, heart, and kidney after ingestion. The metabolism pathway is shown in figure 1. If intervention is not done in time, it can lead to rapid death due to multi-organ failure.[4] Mortality rate associated with paraquat poisoning is very high and is mainly due to respiratory failure and lung damage.[5] We are reporting a case of three years old male child, who got admitted to the department of the pediatric ward with a history of accidental ingestion of paraquat. Unfortunately, the patient could not survive but the objective of this case report is to update health care professionals working in pediatric accidents and emergency and intensive care departments in order to minimize morbidity and mortality associated with paraquat poisoning.

CASE PRESENTATION

A 3-year-old boy was brought by his parents at night to the pediatric emergency department of Ayub Teaching Hospital (ATH), Abbottabad with a history of ingestion of some crop-related chemical at home. The patient ingested the chemical 4 days back and at that time patient was taken to one tertiary care hospital in Mardan, where the child got admitted to the children's ward and managed as a case of organophosphorus poisoning. The patient was given atropine and oxygen therapy. The patient's condition did not improve and in fact worsen during their stay in the hospital. The patient was referred to Peshawar after giving a provisional diagnosis of COVID 19 infection which was negative, but their parents took the patient to ATH, Abbottabad. The patient got admitted to the pediatric ward at night. In the morning round, when thorough history was taken by the consultant doing the round, it was revealed that the child ingested an unspecific amount of herbicide. Mother was told to get a picture of the container. She got the picture of the container via WhatsApp, and it turned out to be paraquat. The content of bottle was 200 gram / Liter, 18.5% w/v. Literature was searched and patient management was started along the lines of paraquat poisoning. The patient was started on methylprednisolone pulses along with vitamin E and C supplementation and N-acetylcysteine. Oxygen therapy was minimized to avoid oxidant injury. The patient's condition remains static for two days

but then started worsening with distress. HRCT show bilateral basal ground glass haze with patchy consolidation right lobe and ABGs showing respiratory failure. The patient was put on CPAP. On the 6th day of admission, the patient collapsed and expired despite resuscitation. At every step of management, parents were counselled about the patient's condition, management, treatment plan, outcome, and prognosis. Proper consent from parents was taken for this case report.

DISCUSSION

There are no known specific antidotes for Paraquat poisoning. So paraquat poison has got high morbidity and mortality. The likelihood of mortality falls into death from pulmonary fibrosis in patients with paraquat poisoning.[6] During the last sixty years, there have been no chelating agents capable of binding the paraquat in blood or other tissues and the focus of management is a modification of the toxicokinetics of the poison by either decreasing its absorption or enhancing its elimination.[7] In one study by Leong YH et al in Malaysia, it was found that paraquat is not only a drug being used for suicide but also a large no of cases are accidental.[8] Shen M, et al in one of their retrospective studies concluded that the use of low-dose steroids along with gastric lavage done at the earliest and blood purification can decrease pulmonary fibrosis incidence.[9] Our patient presentation was too late, and the patient also got continuous oxygen at referring hospital. Su Y et al analyzed indicators of prognosis in their retrospective study including patient's age, serum creatinine, ingested amount of paraquat, urinary protein, paraquat excretion in urine and white blood cell.[9] In our patient the ingested amount was not known and also there is no facility for urine paraquat levels. Elevated amylase level is one of the early prognostic factors for the prediction of mortality and severity of paraquat poisoning.[11] In our patient's serum amylase was also raised. For the management of patients with paraquat poisoning, there is no specific standard therapy. Supportive therapy includes activated charcoal; vitamin C and E, methylprednisolone, cyclophosphamide, and N-acetyl cysteine along with renal replacement therapy.[12] One important aspect of management in children also includes parent's counselling regarding children's safety storage of chemicals in appropriate containers. Provision of the original container is also instrumental in the diagnosis and proper management.

LIMITATION

Limitations of our study were the small sample size due to single hospital data and lack of awareness to perform pap smears in symptomatic patients. The false technique of sample collection due to untrained practitioners or junior trainees, and false interpretation of histopathology slides by the pathologist may be due to machine error or sample preservation technique.

CONCLUSION

Though poisoning in children is common yet proper history is very important for the identification of poisoning substances and proper management.

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