



# **NEW EVIDENCE IN PARAQUAT POISONING**

*Emergency Department – Children's Hospital 2*

# CONTENT

- **Introduction**
- **Management**
  - **Gastrointestinal decontamination**
  - **Specific treatment and antidotal therapy**
    - **Extracorporeal therapies**
    - **Anti-inflammatory and immunosuppressive therapy**
- **Conclusion**



# INTRODUCTION

- **Paraquat ingestion is a leading cause of fatal poisoning in many parts of Asia, Pacific nations, and the Americas**
- **Rapidly-acting, effective, nonselective and relatively inexpensive → widespread use in much of the developing countries**
- **Self-poisoning, suicide**



# INTRODUCTION

- **Swallowing of 20 to 24 % paraquat concentrate**
  - **> 30 mL (a mouthful or two) → lethal**
  - **10 mL → significant illness**
- **The time of ingestion**



# MANAGEMENT

INITIAL MANAGEMENT

GASTROINTESTINAL  
DECONTAMINATION

TOPICAL AND INHALATION

MONITORING

SPECIFIC TREATMENTS AND  
ANTIDOTAL THERAPIES

ONGOING MANAGEMENT



# **GASTROINTESTINAL DECONTAMINATION**

**Paraquat Poisoning – UpToDate 14.0**

**Gastrointestinal decontamination is  
recommended to limit systemic exposure**

**Grade 2C**



# GASTROINTESTINAL DECONTAMINATION

- **Activated charcoal (1 g/kg in water; maximum dose 50 g) or Fuller's Earth (2 g/kg in water; maximum 150 g in water) should be given as soon as possible per oral or via a nasogastric tube to patients who present **within approximately two hours of ingestion****
- Treatment should not be delayed for confirmatory testing
- "... both activated charcoal and Fuller's Earth adsorb paraquat in vitro and thus may be beneficial in minor exposures ..."



# GASTROINTESTINAL DECONTAMINATION

- Decontamination is not useful with delayed presentations due to the rapid absorption and high toxicity of paraquat
- Gastric lavage and forced emesis are contraindicated due to paraquat-induced caustic injury
- In cases that present early, **a nasogastric tube should be inserted and the stomach contents aspirated prior to administration of charcoal**



# MANAGEMENT

**INITIAL MANAGEMENT**

**GASTROINTESTINAL  
DECONTAMINATION**

**TOPICAL AND INHALATION**

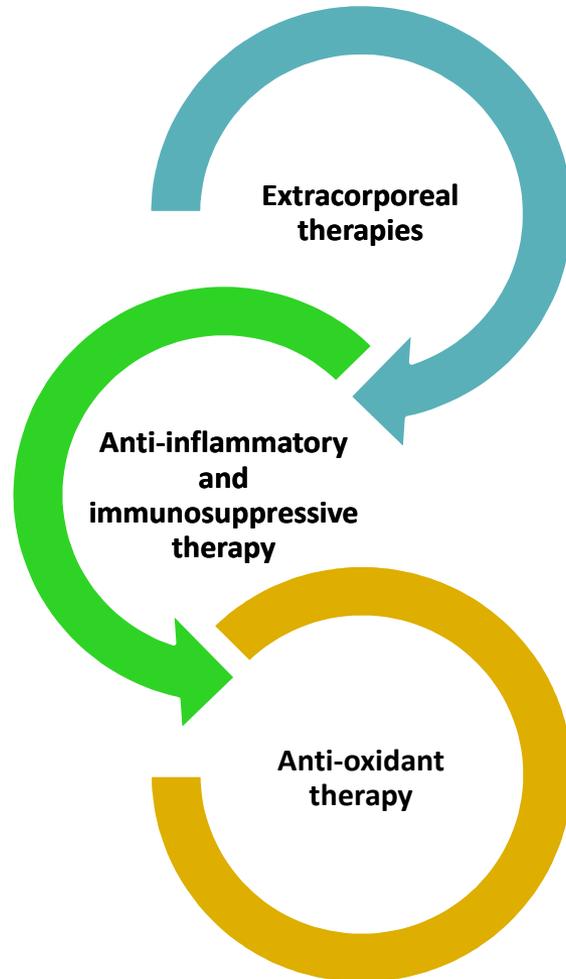
**MONITORING**

**SPECIFIC TREATMENTS AND  
ANTIDOTAL THERAPIES**

**ONGOING MANAGEMENT**



# SPECIFIC TREATMENTS AND ANTIDOTAL THERAPY



# EXTRACORPOREAL THERAPIES

**Paraquat Poisoning – UpToDate14.0**

**Indications for extracorporeal therapies: Treatment with hemoperfusion for four hours if it can be initiated within four hours of ingestion**

**Grade 2C**



# ANTI-INFLAMMATORY AND IMMUNOSUPPRESSIVE THERAPY

**The Cochrane Collaboration**

## **Glucocorticoid with cyclophosphamide for paraquat- induced lung fibrosis (Review)**

*Li LR, Sydenham E, Chaudhary B, Beecher D, You C*



# GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS

- **Types of studies: Randomised controlled trials (RCTs)**
- **Types of participants: Any person with paraquat poisoning**



## **GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS**

- **Types of interventions: All patients were to receive standard care plus either the intervention or control**
  - **Intervention: glucocorticoid with cyclophosphamide in combination**
  - **Control: placebo, standard care alone or any other therapy in addition to standard care.**
- **Studies that focused on any single immunosuppressant or other combinations of therapies were excluded**



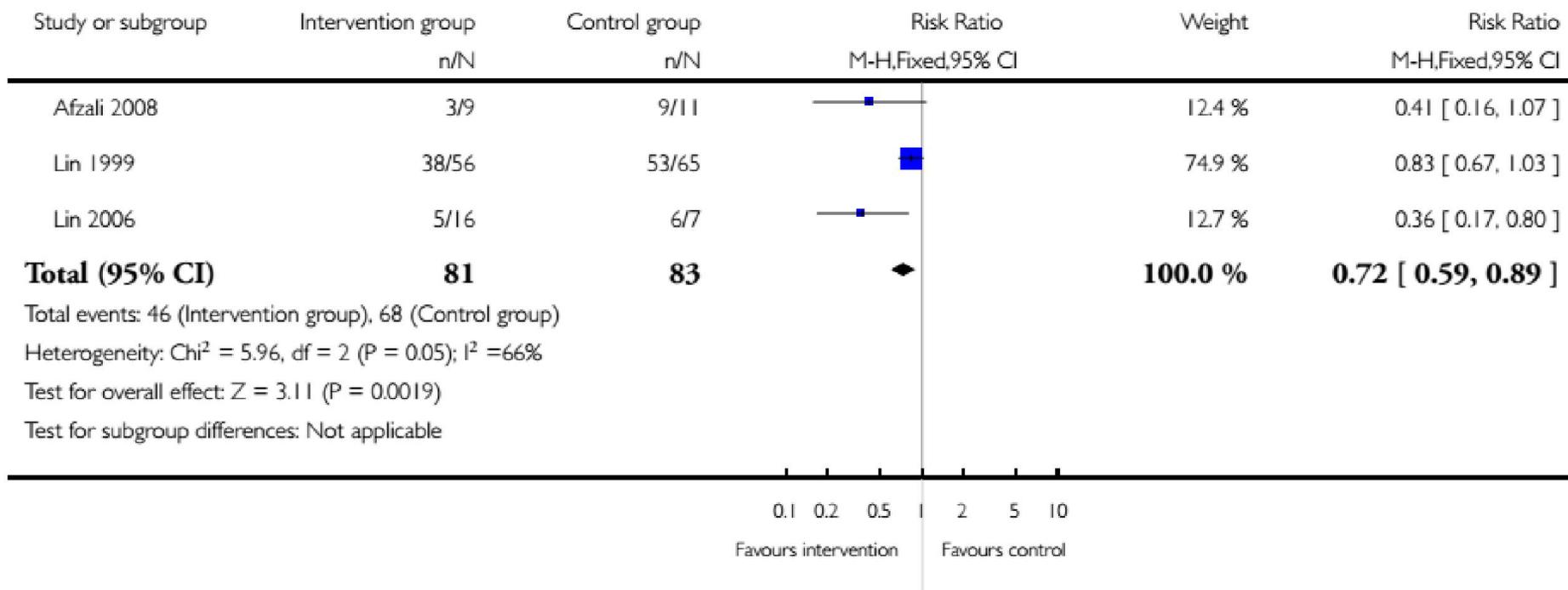
# GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS

## Analysis 1.1. Comparison 1 All-cause mortality at final follow-up, Outcome 1 All-cause mortality at final follow-up.

Review: Glucocorticoid with cyclophosphamide for paraquat-induced lung fibrosis

Comparison: 1 All-cause mortality at final follow-up

Outcome: 1 All-cause mortality at final follow-up



# GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS

- **This systematic review includes three trials with a combined total of 164 participants who had moderate to severe paraquat poisoning**
- **All three trials reported death at the end of the follow-up period**



## **GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS**

**Patients who received glucocorticoid with cyclophosphamide in addition to standard care had a lower risk of death than those receiving standard care alone (RR 0.72; 95% CI 0.59 to 0.89)**



# GLUCOCORTICOID WITH CYCLOPHOSPHAMIDE FOR PARAQUAT-INDUCED LUNG FIBROSIS

Based on the findings of three small RCTs of moderate to severely poisoned patients, **glucocorticoid with cyclophosphamide in addition to standard care may be a beneficial treatment for patients with paraquat-induced lung fibrosis**



# CONCLUSION

- **Standard care for removing paraquat from the body involves gastrointestinal decontamination and hemoperfusion**
- **Immunosuppressive treatment using glucocorticoid and cyclophosphamide in combination may be beneficial**



**THANK YOU  
FOR YOUR ATTENTION**

