

# A New Treatment Approach for Acute Paraquat Poisoning

Dear Editor,

Paraquat (PQ, 1,1'-dimethyl-4,4'-bipyridinium dichloride) is one of the most toxic pesticides available here in the Middle East. Clinical manifestations and outcomes of acute PQ poisoning depend on the volume of PQ ingested orally. Ingestion of as little as 5 mL of the 20% weight/volume PQ solution is sufficient to cause death in more than 50% of cases. The mortality rate varies between 50% and 90%.<sup>[1]</sup> It has been suggested that the mechanism is primarily related to oxidative damage, reactive oxygen species, immune activation, and inflammatory mediators.<sup>[2-5]</sup>

PQ poisoning is characterized by multiple organ dysfunctions and rapid onset of death within days of ingestion in most patients. Common PQ toxicity symptoms are necrosis of mucous membranes (pseudodiphtheria), esophageal rupture, hypotension, acute liver injury, severe diarrhea, hemolytic anemia. Pancreatitis, mediastinitis, subcutaneous emphysema, pneumothorax, acute renal failure and acute respiratory distress syndrome that followed by progressive pulmonary fibrosis.<sup>[1-5]</sup>

All PQ exposures should be treated as potentially life threatening. Many medical interventions have been proposed for the treatment of patients with acute PQ poisoning but data supporting their efficacy are lacking. Many publications report concurrent administration of a number of therapies in the hope of a benefit, including gastric lavage, activated charcoal and other adsorbents, fluid infusion, antioxidants (N-acetylcysteine, Vitamins C and E, naringin, silymarin, edaravone, quercetin), lysine acetylsalicylate, immunosuppressants (cyclophosphamide and corticosteroids), prolonged extracorporeal detoxification (hemodialysis and hemoperfusion), hypo-oxygenation, lung radiotherapy, and lung transplantation.<sup>[1-5]</sup>

The efficacy of these therapeutic methods remains uncertain, and the outcome of PQ poisoning is still disappointing, with a high mortality.

Unfortunately, PQ consumption is a common agent of suicidal poisoning in Iran and Isfahan province, resulting in very high morbidity and mortality.

Due to the lack of a single, fully effective therapeutic guideline for the treatment of PQ poisoning, the department of clinical toxicology of Isfahan university of medical sciences has developed a multispect therapeutic approach which its therapeutic components have been investigated in previous studies and compares it with the standard treatment method which is recommended by the popular textbooks of acute poisoning (e.g., Goldfrank's toxicological emergencies). Our treatment strategies will be investigated in the next 2 years, and then, the result will be released. The main components of our proposed new approach for the treatment of PQ poisoning are the utilization of hemodialysis, N-acetylcysteine, Vitamins C and E, silymarin, curcuma, pirfenidone, selenium, methylprednisolone, and pantoprazole.

We hope to have the chance of publishing the important result of this clinical trial in your esteemed journal.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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