Bilateral pleural effusion as a rare complication of intravenous prallethrin poisoning

Sir,

Prallethrin, a type 1 pyrethroid compound is commonly available as 'All-OUT', a liquid mosquito repellent vaporiser. Acute prallethrin poisoning is rare, mostly occurring through dermal and oral routes.[1] Only one case has been reported wherein self-injection of prallethrin was observed.[2] Neurological, as well as gastrointestinal manifestations, have been described in literature till date.[3] Herein, we report a rare case of an 18-year-old female who after the self-injection of prallethrin developed bilateral pleural effusion and acute lung injury. She was managed with symptomatic treatment and discharged with successful outcomes within two weeks of presentation.

She was initially admitted to a local hospital with self-injection of 5 ml of 'ALL-OUT' liquid where gastric lavage was performed. She presented to us with complaints of breathlessness and fever. On examination, the patient was conscious, alert with pulse 110 beats per minute, respiratory rate 38 per minute, blood pressure 102/64 mm of Hg. Oxygen saturation was 70% on room air.

Respiratory system examination revealed bilateral vesicular breath sounds with decreased air entry in the infrascapular area. Local examination revealed injection site over the antecubital area of the left upper extremity. Electrocardiography revealed a normal sinus rhythm. All blood investigations were within normal limits. Arterial blood gas analysis showed pH 7.55, partial pressure of oxygen (Pa O_2) 65 mm of Hg, partial pressure of carbon dioxide ($PaCO_2$) 21 mm of Hg. Chest radiography suggested bilateral pleural effusion [Figure 1]. Pleural fluid was turbid yellow in nature with a leucocyte count of 790 cells/mm^3 (polymorphs 90% and lymphocyte 10%), protein 2.9 gm/dl and sugar 116 mg/dl. Contrast-enhanced computed tomography chest demonstrated multifocal patchy areas of consolidation in bilateral lung fields predominantly peripherally, areas of ground glassing with bilateral pleural effusion. 2D echocardiography was normal. Inflammatory markers were elevated with interleukin (IL)-6 243 pg/ml, C-reactive protein 230 mg/L, Ferritin 371 ng/ml, D-dimer 3758 ng/ml and pro-calcitonin 19 ng/ml. Reverse transcription polymerase chain reaction (RT-PCR) test for coronavirus disease 2019 (COVID-19) was reported negative.

The patient was initially administered oxygen therapy @ 10-15L/min via a non-rebreathing mask. When patient failed to maintain adequate oxygenation via a non-rebreathing mask, non-invasive ventilation was attempted with continuous positive airway pressure in the range of 10-12 cm H_2O. Broad spectrum antibiotics and intravenous paracetamol were administered. The patient's clinical condition improved as evident by declining oxygen requirement. Follow up chest X-ray after two weeks showed no signs of pleural effusion [Figure 2].

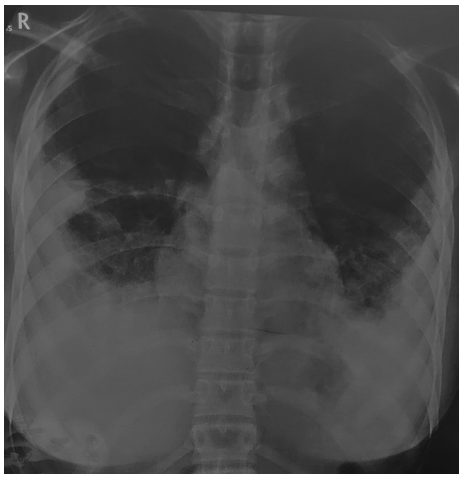

Figure 1: Chest radiological findings of the patient at the time of admission

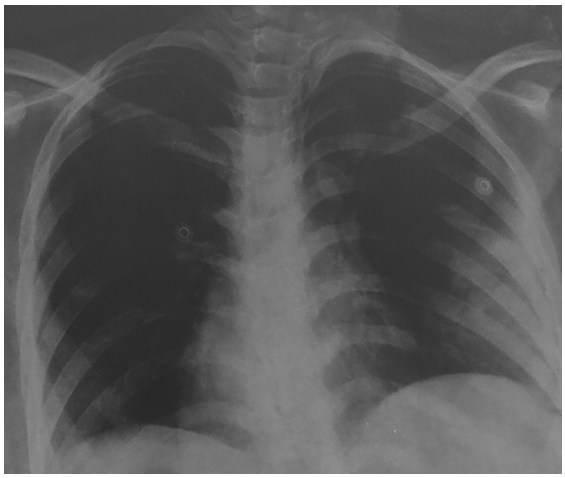

Figure 2: Chest radiological findings of the patient after clinical recovery

Prallethrin has toxic effects on voltage-sensitive sodium channels and delays their closure causing prolonged depolarisation.[3] It has poor absorption through skin and rapid metabolism to inactive metabolites in humans.[1,4] No specific antidote is available for prallethrin poisoning. Symptomatic management is the mainstay of treatment.[1]

Our patient presented with febrile illness and ground glassing on the CT chest, accompanied by raised inflammatory markers, and it became important to screen the patient for COVID-19 infection as the primary cause or secondary infection.[5] However, the primary presentation of bilateral pleural effusion following self-injection of prallethrin precluded COVID-19 from becoming our initial differential diagnosis. The surge in inflammatory markers was probably due to hypersensitivity reaction to prallethrin in lung tissue. The pleural effusion was probably reactionary to acute lung injury.

Although there are studies both in favour of and against the use of steroids in prallethrin poisoning cases, steroids were not used in this case.[6] The clinical resolution became evident within 72-96 hours of instituting supportive treatment which reinforced the decision of not administering steroids.

Easy over-the-counter availability of prallethrin necessitates randomised controlled trials investigating the clinical presentation as well as antidote of prallethrin to be undertaken in the future. The diagnosis can be more challenging in the COVID-19 era taking into consideration the overlapping symptomatology; biomarkers can be useful in this regard as in other conditions including intoxications.[7] Early admission, a strong degree of suspicion and early symptomatic management are keys to successful outcomes.

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Conflicts of interest

There are no conflicts of interest.

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