Chronic organophosphate-induced neuropsychiatric disorder: a case report

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Abstract: Chronic organophosphate (OP)-induced neuropsychiatric disorder is a rare condition following prolonged exposure to OP compounds. Due to the lack of valid diagnostic tools and criteria, very few cases are seen in clinical practice and are often misdiagnosed. Misdiagnosis can lead to inappropriate treatment that may increase the risk of morbidity or suicidality. In this paper, we present the case of a 35-year-old male who needed support in breathing from a mechanical ventilator and developed neuropsychiatric behavioral problems following ingestion of OP compounds, which lead to suicidality. The patient was treated by the psychiatric team with antipsychotic and antidepressants and improved following the regular use of medication.

Keywords: COPIND, mood liability, suicidal thoughts

Introduction

As a country where agriculture is predominant, Nepal uses a lot of organophosphate (OP) pesticides as they are commonly available. OP pesticide poisoning is a leading cause of morbidity and premature loss of life in many developing countries, including Nepal.1

Chronic OP-induced neuropsychiatric disorder (COPIND) is a condition characterized by a prolonged exposure to OP pesticides (with or without acute cholinergic episodes) and the development of various neuropsychiatric symptoms.2 Follow-up studies of individuals who were exposed to high levels of the OP compound have shown an emergence of certain similar types of neurobehavioral changes, which has been termed together as COPIND.3 The neurobehavioral changes include anxiety, mood swings, emotional lability, depression, fatigue, irritability, drowsiness, confusion, and lethargy.4 The purpose of this case study is to determine the neuropsychiatric manifestation of prolonged exposure to OP compounds. As few cases of this kind have been reported or seen in practice, this report may help others in understanding and diagnosing COPIND.

Case report

In an attempted suicide after quarreling with his wife, a 35-year-old male farmer from the plain (Terai) region of Nepal poisoned himself with OP pesticide (malathion). He had been using OP as a pesticide in his field, as per the advice of an agriculture technician, for over a week at the time of the incident. The unconscious farmer was taken to a nearby hospital in India, near the border, where he suffered from vomiting, salivation, and diarrhea.

After being on a mechanical ventilator for 9 days, he was brought to the National Medical College and Teaching Hospital, Birgunj, Nepal. The patient’s record showed that his symptoms included deep coma (Glasgow Coma Scale E1V1M1), hypotension (80/56 mmHg), tachycardia (128/min), miosis, and...
but the patient was advised to continue taking fluoxetine. At the 1-month follow-up. Gradually quetiapine was stopped, and behavior was seen at this 2-week follow-up, as well as advised to return for a 2-week follow-up at the Psychiatry the patient was discharged with the same medication and family members. Upon persistent requests from the family, started once daily and suicidal precaution was explained to were persistent. An antidepressant, fluoxetine 20 mg, was consumed alcohol occasionally, but did not portray patterns of dependency. In addition, the detailed history explored the attempted suicide and saw it as an impulsive act rather than one motivated by depression. The patients' medical history showed mood swings along with suicidal thoughts were persistent. An antidepressant, fluoxetine 20 mg, was started once daily and suicidal precaution was explained to family members. Upon persistent requests from the family, the patient was discharged with the same medication and advised to return for a 2-week follow-up at the Psychiatry Outpatient Department. Gradual improvement in his mood and behavior was seen at this 2-week follow-up, as well as at the 1-month follow-up. Gradually quetiapine was stopped, but the patient was advised to continue taking fluoxetine. At the 3-month follow-up, a detailed evaluation revealed that the patient had reached the premorbid level. Fluoxetine was continued for another 6 months then gradually tapered out and discontinued. Ethical approval from the Institutional Review Committee was obtained before this study. Informed, written consent was taken from the patient prior to the study.

Discussion
Studies on the long-term effects of high dose OP compound exposure are limited by the non-specific nature of these symptoms, and by the low sensitivity and specificity of the neurophysiological scoring system. Moreover, Ethical approval from the Institutional Review Committee was obtained before this study. Informed, written consent was taken from the patient prior to the study. Studies on the long-term effects of high dose OP compound exposure are limited by the non-specific nature of these symptoms, and by the low sensitivity and specificity of the neurophysiological scoring system. Moreover, Ethical approval from the Institutional Review Committee was obtained before this study. Informed, written consent was taken from the patient prior to the study.
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even if the typical portrayal is of brief impulsive suicidal thoughts, this later may become more persistent suicidal thoughts due to the levels of exposure.4 Following recurrent brief suicidal thoughts and mood swings, the patient was started with an antidepressant, which has been found to be effective in the past. A significant proportion of patients diagnosed with COPIND have found that selective serotonin reuptake inhibitors, especially fluoxetine 20 mg, can be beneficial for treating both suicidal thoughts and mood swings.4 In addition to pharmacological therapy, psychological approaches have also been found to be effective in such cases, although we did not consider it due to the lack of access. Cognitive therapy, similar to those used in chronic or degenerative neurological conditions, is the most appropriate, as they essentially involve problem solving and coming to terms with the disability.4

Conclusion
The neuropsychological problems associated with prolonged exposure of OP compounds need to be studied using a systematic and methodical approach. There is a need of appropriate assessment and diagnosis in the early stages of exposure, which would assist in formulating appropriate strategies to manage such cases with the available resources. Careful monitoring of these disorders not only reduces the treatment costs but also reduces associated morbidity and mortality.

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