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Insecticide Exposure in Early Pregnancy: A Case of Acute Vaginal Bleeding Leading to Pregnancy Loss

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Abstract

Insecticide exposure during pregnancy is a significant public health concern, with potential risks to both maternal and fetal health. We report a case of a 27-year-old woman at six weeks gestation who presented with acute vaginal bleeding following inadvertent exposure to an organophosphate-containing insecticide sprayed by her husband while she was asleep. The bleeding progressed from mild spotting to heavy with clots. Despite stabilization and conservative treatment, a follow-up ultrasound confirmed fetal demise. This case highlights the toxic effects of organophosphate exposure in early pregnancy and emphasizes the importance of awareness, education, and preventive strategies.

Introduction

Organophosphates (OPs) are a class of cholinesterase-inhibiting insecticides widely used in agricultural and domestic settings. Due to their lipid solubility and volatility, organophosphates can easily cross biological membranes, including the placenta, potentially affecting embryonic development [1,2]. Environmental exposure to OPs has been associated with adverse reproductive outcomes such as miscarriage, fetal growth restriction, and congenital malformations [3,4]. While chronic exposure has been more extensively studied, acute effects particularly those manifesting as immediate vaginal bleeding in early pregnancy remain underreported.

Case presentation

A 27-year-old gravida 2 para 1 woman at eight weeks gestation presented with a 24-hour history of vaginal bleeding, which began as spotting but became progressively heavier with thick clots. There was no abdominal pain or cramping. There was no history of similar episodes in her previous pregnancies, nor any known hematologic or gynaecologic disorders.

She recounted recent exposure to an insecticide sprayed indoors by her husband during the night. The specific product was later identified to contain organophosphate compounds. She was unaware of the spraying and remained asleep in the enclosed room for several hours.

On examination, she was stable (BP: 110/70 mmHg, HR: 82 bpm). Speculum examination revealed an open cervical os with active bleeding. A bedside transvaginal ultrasound showed an intrauterine pregnancy with cardiac activity and a subchorionic haemorrhage. Laboratory tests were normal.

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She was admitted for monitoring, given intravenous fluids, and placed on progesterone therapy. Bleeding stoped and she was discharged after 48 hours. However, a follow-up scan two weeks later revealed fetal demise.

Discussion

Organophosphates exert their toxic effects by irreversibly inhibiting acetylcholinesterase, leading to the accumulation of acetylcholine at synapses and neuromuscular junctions [5]. In non-lethal exposures, especially in pregnant women, subclinical effects can still impact vascular tone, endocrine regulation, and placental perfusion, all critical in early pregnancy maintenance [6].

Animal studies have demonstrated that organophosphates can induce oxidative stress, DNA damage, and interfere with implantation and embryogenesis [7,8]. Furthermore, OPs may cross the placenta, accumulating in fetal tissues and disrupting cellular signaling pathways necessary for normal fetal development [9]. Some human studies have correlated maternal OP exposure in early pregnancy with spontaneous abortion, intrauterine growth restriction, and neurodevelopmental disorders in offspring [3,4,10].

In this case, the acute onset of vaginal bleeding immediately following exposure supports a probable toxicologic mechanism. The subchorionic hemorrhage may reflect vascular injury or placental inflammation, consistent with OP-mediated endothelial dysfunction [11]. Though no systemic symptoms of poisoning (e.g., miosis, bradycardia, muscle fasciculations) were observed, low-dose or inhalational exposure can result in subclinical but still harmful biological effects [12].

This case reinforces the need for clinicians to consider environmental toxicants in the differential diagnosis of early pregnancy complications. Additionally, pregnant women should be educated to avoid unventilated indoor use of pesticides, especially those containing organophosphates.

Conclusion

This case presents a probable link between indoor exposure to an organophosphate insecticide and acute vaginal bleeding leading to pregnancy loss. Given the widespread use of these agents in households across many developing countries, there is a critical need for regulatory guidance, community education, and early detection of environmental hazards during pregnancy.

Author declarations

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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