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Original Article

The Impact of Carbide Gun Applications on Public Health: A Comprehensive Analysis of Ocular and Systematic Hazards

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Abstract

Calcium carbide gun is common chemical with many agriculture applications, but it is also a popular ingredient for making firecrackers. The comprehensive study of impact of Carbide Gun is important as per public health. Basically, the Calcium Carbide guns originally designed as "scare gun" for agriculture pest control, have increasingly shifted into recreation use as low-cost substitutes for traditional firecrackers. This tradition has led to a significant public health crisis, characterized by severe ocular thermos-chemical injuries and permanent vision loss among children and young adults. This paper explores the chemical mechanisms, clinical sequelae of injuries, sociodemographic factors influencing their spread, and necessary regulatory intervention.

Keywords: *Calcium Carbide Gun, Public Health, Explosive Injuries, Ocular injuries, Harmful, Blindness etc.*

Introduction:

A calcium carbide gun is a homemade makeshift toy gun, costing approximately 150 rupees in the market. This gun is made from a mixture of a plastic pipe, a gas lighter, and calcium carbide. When water is added to the carbide, it produces acetylene gas. Upon contact with a spark from the lighter, this gas explodes with a loud sound, which has become its "fad." However, in this explosion, plastic fragments are ejected like shrapnel, penetrating the body and causing serious injuries. When the mixture ignites, it produces a violent blast that propels debris and burning gas, often hitting the face and eyes directly.

In October 2025, a surge in serve eye injuries linked to "carbide gun" occurred across India, particularly in Madhya Pradesh, following a viral social media trend during the Diwali festival. During this festival, more than 122 children across Madhya Pradesh have been admitted to hospitals with serve eye injuries, while 14 have lost their eyesight. Some patients being treated in the ICU, and many may never regain full vision.

Mechanism and Dangers: The guns use calcium carbide mixed with water, which produces highly flammable acetylene gas. Upon ignition, the creates a powerful blast that can spray hot calcium hydroxide (an alkali), causing immediate chemical and thermal burns to eyes and skin. Many injuries occurred when users leaned over the barrel to check the device after a delayed reaction or a "misfire".

Major Hazards:

Chemical reaction hazard: Acetylene gas released from calcium carbide when in contact with highly flammable and can explode with even a small spark.

Explosive injuries: in this explosion, tiny plastic and metal particles are ejected, causing serious injuries to the eyes, face, and skin.

Fire and Burns: Burning acetylene gas poses a risk of burns or fires.

Danger of attraction to Children: These guns are seen as toys, which can lead to children using them unknowingly and causing serious accidents.

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Harmful Effects:

- Health Effects:

1. Cases of loss of eyesight have been reported.
2. Many children have suffered permanent scarring or burns on their face and skin.
3. Explosions can cause ear damage, headaches, and mental trauma.

- Environment Impact:

1. Gases released from calcium carbide contribute to air pollution.
2. Plastics pipes and other waste materials are released as waste, releasing toxic substances into the environment
3. This process also increases noise pollution, which adversely affects animals and birds.

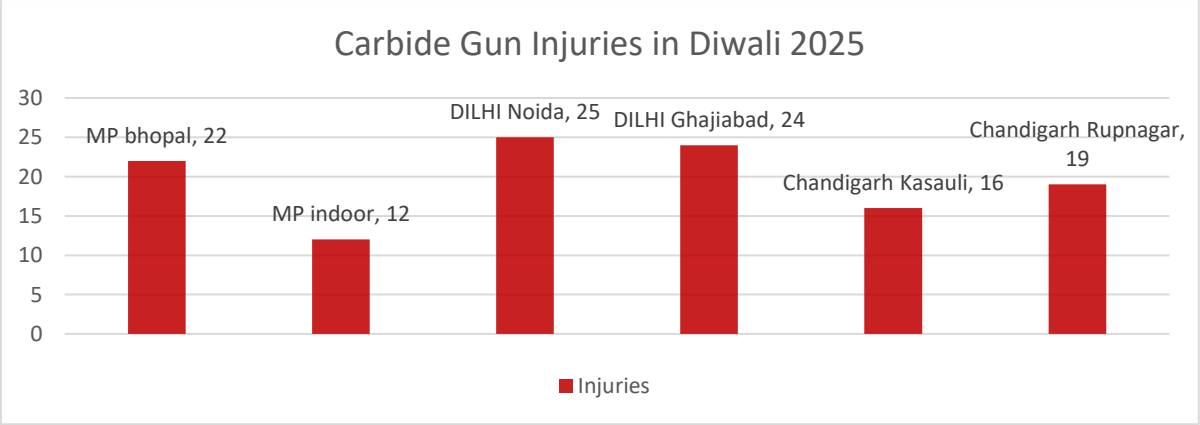
Impact and Injuries:

- Widespread Casualties: Over 300 people in Madhya Pradesh alone suffered eye injuries ranging from irritation and chemical burns to total vision loss. At least 14 children were reported to have gone blind due to these devices.
- Demographics: The majority of victims were children and teenagers aged between 7 and 14.
- Severity of Damage: injuries often included grade 3-4 alkali burns, corneal opacity, and facial burns. Doctors noted that full restoration of vision in severe cases is rare, with many requiring corneal transplants.
- Geographic Reach: Major incidents were reported in Bhopal, Odisha, Gwalior, Indore, and Delhi-NCR.

Way Forward

- **Strict Ban:** The sale, manufacture, and distribution of such hazardous products should be immediately banned.
- **Awareness Campaign:** Children and parents should be informed about the dangers in schools and communities.
- **Legal Action:** Criminal cases should be filed against those selling such products and they should be severely punished.
- **Promotion of Safe Alternatives:** Safe, environmentally friendly, and traditional entertainment options should be promoted during festivals like Diwali.
- **Medical Assistance:** Specialized eye and skin treatment centers should be established for injured children, and government compensation should be provided.

Graphical view of Injuries in Diwali 2025



Purpose:

The purpose of this study was to report a case series of sight-threatening ocular injuries caused by calcium carbide guns used as fire crackers.

Method:

Most of these cases were reported from Bhopal and a few neighboring districts and were being treated in hospitals here, about 50 were reported from Gwalior and Jabalpur. Medical records of 15 eyes of 14 Patients with ocular injuries caused while using carbide guns, during the year 2025, were retrospectively reviewed. The collection data included patients demography (age, sex), presenting ophthalmic features, management, and outcome. All patients are male. The mean age of the patients was 23 ± 12 years.

Conclusions and recommendations:

Calcium carbide related ocular injuries can result in corneal blindness secondary to limbal stem cell deficiency in young individuals. Loss of vision in this age group can lead to loss of economic productivity and beautifying disfigurement. More advocacy effort is thus needed to prevent these injuries.

Carbide gun application has beyond their original agriculture scop to becomes a critical public health threat.

To mitigate this crisis:

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1. Regulatory bans: Governments should enforce strict prohibitions on the illegal manufacture and sale of these devices under the Arms Act and Explosive Act.
2. Public Advocacy: Immediate awareness campaigns are needed, specifically targeting parents and youth in semi-urban and rural areas.
3. Content Moderation; Social media platforms should monitor and restrict tutorials that encourages the DIY construction of hazardous carbide devices.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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