Fireworks-Related Limb Injury in a Nigerian Neonate

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Authors’ contributions
This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

ABSTRACT

Aims: We report an unusual case of firework blast injury to the trunk and left lower limb in a one-week-old neonate and reviewed relevant literatures.

Study Design: Case report.

Presentation of Case: Different types of injuries could be sustained following explosives used for fireworks during festivities. Fireworks-related blast injury to the limb in a neonate following accidental explosion is a rare finding in the literature and it can be associated with grave morbidity and mortality. Our index patient though survived but had accompanying morbidities.

Discussion: As fireworks-related limb injuries result in significant morbidity, public education regarding the proper use of fireworks would help in preventing the incidence of these injuries.

Conclusion: Advocacy for a strict legislation and enforcement to regulate its use in Nigeria would be the panacea.

Keywords: Fireworks; injury; Nigerian; neonate.
1. INTRODUCTION

Fireworks injuries are common occurrences all over the world during festive periods [1,2]. In Nigeria, fireworks or “bangers” are commonly used during Christmas and New Year holidays. Consumer fireworks, formerly known as “Class C” fireworks and often inappropriately referred to as “safe and sane” fireworks, include fountains and candles that shoot out sparks or flaming balls, rockets with sticks called "bottle rockets", other rockets, firecrackers, sparklers, smoke devices, jumping jacks, Chinese crackers, rookies and deer scarers, and aerial shells [3].

Bird-scaring explosives (rookies and deer scarers) are now being modified and used as fireworks in bonfire night celebrations [4]. In different places across the world, these bangers and other explosives are used during celebrations and holidays. Examples are the holidays of Eid-el Adhab among the Arab and Druze population, the Jewish Purim festival in Israel [1], the Muslim Hari Raya Eid-el Fitri to mark the end of the fasting month and the Indian Deepavali festival, where firecrackers are often used traditionally during the celebration [2].

“Bangers” are simply fireworks consisting of a rolled paper tubes filled with gunpowder. The tubes which are made of heavy paper casing also have a fuse at the top [5]. The banger is lit and then thrown at a distance or sometimes held with the hands and thrown after a short pause and it explodes with a loud bang. Following experiments, the mechanisms of fireworks injuries have been suggested to possibly follow missiles or projectiles, pressure and heat from the exploded fireworks especially when close to body tissue. Injuries could be caused by blunt or sharp objects [6].

In all of these, multiple injuries involving the trunk, skin, eye, ear, face, hand and limb injuries have been reported [7-10]. Some studies in developed countries have documented lower limb injuries following the use of fireworks [8] but none to the best of our knowledge has been reported in our sub region.

We hereby report the first case of limb injury in a neonate caused by “banger” in Nigeria.

2. CASE PRESENTATION

We present a one-week-old male baby who was admitted with a day history of firework (banger) blast injury to the left leg and trunk. He was hit by a firework thrown by an unidentified individual during a festive period that accidentally landed on where he was laid. He subsequently developed severe burn wound to the left lower limb and posterior trunk.

Initial care was at a peripheral hospital where dressing was applied before being referred to our facility for further care. There was no intercurrent medical illness. He was immunized for age and on exclusive breast feeding.

He was ill-looking, warm to touch (37.4°C), not pale, mildly dehydrated and not cyanosed. The pulse rate is 138 / minute and respiratory rate 60 cycles / minute.

Abdominal and urogenital examinations were essentially normal.

Musculoskeletal examination at presentation in emergency department showed areas of hyperpigmentation, desquamation involving the trunk, left lower limb extending to the left foot with gangrene (Figs. 1 and 2).

There is skin loss over the posterior trunk extending from the nuchal line to the buttocks.

A diagnosis of firework blast injury to the left lower limb and posterior trunk was made. He was resuscitated and stabilized by administration of oxygen via nasal catheter, intravenous fluid, intravenous antibiotics, analgesics, tetanus prophylaxis and had serial wound debridement. Wound care was with honey based dressing.

Management was hampered by lack of funds as the parents could not source funds for a below the knee amputation of the gangrenous left foot.

He made some clinical progress but subsequently discharged against medical advice 5 days after admission.

3. DISCUSSION

Fireworks are devices designed for the purpose of producing a visual or audible effect (or both) by combustion, deflagration, or detonation which people find very attractive. Unfortunately, the devices may cause major injuries both to the users and bystanders [11]. Our patient was injured in a baby seater while at home.

In this report, the injury occurred during the Christmas festival as similarly reported from other studies where such injuries occurred during festivities in Israel, India and Iran (Persian
In previous studies in China, children below the age of 15 years made up 63% of cases [12], while in India, individuals aged less than 20 years made up 60% of the cases [2]. Hence, banger-related injuries are commoner in children and adolescents as similarly reported by Buja et al. [9].

In a study by Isa et al. in Malaysia spanning between 1986 and 1990, of a total of 38 patients studied, only 2 were bystanders [8]. This buttress the fact that closeness to the area of explosion of bangers or any other form of firecracker is dangerous as the explosion tends to release missiles, and so can hit anybody within the vicinity as was the case with the index patient who was laid in a baby seater at home. Other studies have corroborated similar injuries among bystanders [2,12].

Of all the patients with firework injuries seen at the emergency unit by Isa et al., 32 (84.0%) needed hospitalization with an average in-patient stay of 12 days [8]. Our index patient stayed for 5 days as parents could not cope with the financial implications.

The frequency of firework injuries was noted to have reduced in cases where strict restrictions or enforcement of the law occurred [9,13,14]. This highlights the fact that legislations and law enforcement are necessary to curb this menace.
This may help to reduce associated morbidity from these agents of injuries during festivities [15,16].

Public health education effort should be strengthened and emphasize the following:

1. Children and their families should be encouraged to enjoy fireworks at public fireworks displays conducted by professionals rather than purchase fireworks for home or private use.
2. Younger children should not be allowed to play with fireworks under any circumstance.
3. If parents wish to permit older children to play with fireworks, close adult supervision must be present.
4. Ignite fireworks outdoors in a clear area away from houses and inflammable materials.
5. Never ignite fireworks in a container to avoid formation of splinters and missiles.
6. Never play with self-made or modified fireworks.
7. Legislations and law enforcement are necessary in Nigeria to curb this menace.
8. Babies and vulnerable children should not be brought close to the vicinity of fireworks.

4. CONCLUSION

Banger-related limb injuries results in significant morbidity and limb loss in some circumstances. Public education regarding proper use of bangers, strict legislation regulating their use and undue exposure of children to such hazards would help in obviating the incidence of these injuries.

CONSENT

All authors declare that written informed consent was obtained from the guardian for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that this study have been performed in accordance with the ethical standards laid down in the 1964 declaration of helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES


