Case Report

A Rare Complication of Intravenous Phenytoin Induced Purple Glove Syndrome

Tamilselvan[1], Lakshmi sabapathi[2], Syedraja[3], Karthikeyan[4], Gunaseelan[5], Mayakrishnan[6], Veenu[7]

[1]Assistant Professor, Department of General Medicine, Government Medical College and Hospital, Nagapattinam, Tamilnadu, India, [2] Assistant Professor, Department of Pharmacy Practice, E.G.S Pillay college of Pharmacy, Nagapattinam, Tamilnadu, India, [3-7]Internship, E.G.S Pillay college of Pharmacy, Nagapattinam, Tamilnadu, India,

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Abstract

Purple Glove Syndrome is a relatively uncommon complication of intravenous phenytoin administration with clinical manifestations of pain, edema, and purple-blue discoloration at the injection site. Here we report a case of Purple Glove syndrome induced by intravenous administration of phenytoin. The case report describes about a 75-year-old male, who presented to the Emergency Department with chief complaints of generalized tonic - clonic seizures for which he was managed with Inj. Phenytoin. Later patient sensorium improved and 4 hours later the patient had pain and swelling over the left hand and wrist distal to the IV cannula site followed by reddish-purple discoloration over the edematous site. Left upper limb Doppler was done & it showed left-hand cellulitis with no evidence of thrombus. Then the patient was reassured and treated with removal of IV cannula, left-hand elevation, warmth application, analgesics and change of antiepileptics. Such medications like phenytoin should be handled carefully to avoid difficulties in the future. Early detection, rapid monitoring, and management are essential.

Keywords: Generalised tonic-clonic seizure, Phenytoin, Complication, Purple glove syndrome

Introduction

Seizure is one of the neurological disorders encountered frequently and phenytoin is the commonly used antiepileptic. Phenytoin has many adverse effects and Purple Glove Syndrome is relatively uncommon complication of intravenous phenytoin use characterised by pain, edema, and discoloration at the injection site and it progress to the distal limb. [1]

In an important report that was first published in 1984, the adverse effects of phenytoin were brought to become apparent. Specific symptoms including pain, quick onset of discoloration, and progressive tissue necrosis to the distal extremity through which the drug was administered, were all reported. Later in 1992, it contained the term "purple glove syndrome" (PGS). PGS was characterized by delayed soft tissue mutilation of the hand and forearm after IV phenytoin treatment.[2]

A dark purple-bluish darkening of the skin surrounds the site of IV phenytoin infusion during

Corresponding Author: S. Tamilselvan, Professor and Head, Dept of Forensic Medicine, Great Eastern Medical school & Hospital, Ragolu, Srikakulam, Andhra Pradesh.

E-mail: forensic1pokiri@gmail.com

the first stage, which manifests within 2 to 12 hours after the infusion. Edema sets in during the second stage, which manifests in the latter 12 to 16 hours, and the dark purple-bluish discoloration around the skin around the infusion site progresses. Curing of PGS begins with the resolution of edema and subsidence of skin tissue discoloration during the lag stages. [3-4]

When possible, patients at risk for PGS should investigate other anticonvulsants in addition to supportive care. Mostly the cases resolve within days to weeks. [1]

Here we report a case of a patient who developed Purple Glove Syndrome followed by intravenous administration of phenytoin.

Case Description

A 75-year-old male patient presented with the chief complaint of 1 episode of seizure, Generalised tonic clonic type associated with Up rolling of eyes, Loss of consciousness and vomiting (2 episodes). Patient had history of Hypertension, Old CVA. Seizure disorder with poor compliance and also had a history of self-fall 3 months ago (patient did not take adequate treatment and patient was bedridden for the past 3 months)

On Examination, the Patient was drowsy, disoriented, afebrile and not responding to normal stimuli. Vitals were stable, neurological examination - drowsy, partially obeys oral commands, moves all 4 pupils & bilateral plantar flexor response.

After initial stabilization, the Patient was treated with a loading dose of injection Phenytoin intravenously via a 20G IV cannula over 30min. Later patient sensorium improved and 4 hours later the patient had pain and swelling over the left hand and wrist distal to the IV cannula site followed by reddish-purple discoloration over the edematous site.

Local examination revealed normal pulse & reddish-purple discoloration with edema distal to the IV cannula site. Left upper limb Doppler was done & it showed left-hand cellulitis with no evidence of thrombus.

Based on the above findings, the patient was diagnosed with *Phenytoin-induced Purple Glove Syndrome*. The patient was treated with reassurance, removal of varying poorly under IV cannula, left-hand elevation, warmth application, analgesics, and change of antiepileptics (phenytoin to Levetiracetam).

The patient's symptoms gradually resolved and discharged

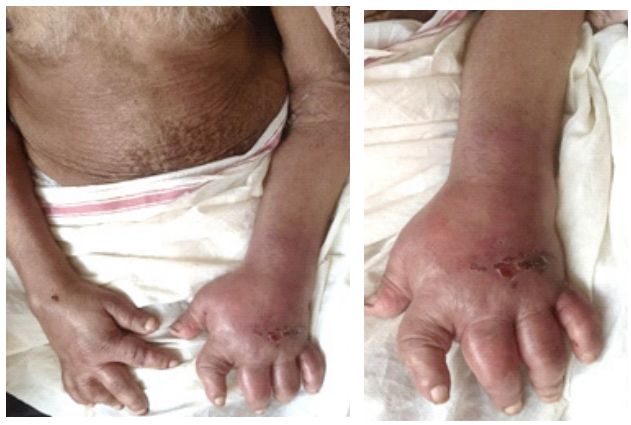

Fig 1, 2: swelling over the left hand at the IV cannula site followed by reddish-purple discoloration

Discussion

A narrow therapeutic index anticonvulsant drug called phenytoin has been used for many years to treat and prevent seizures. A serious undesirable effect known as "Purple Glove Syndrome (PGS)" for its distinctive purplish-black coloring, edema, and discomfort distal to the site of injection can occur after intravenous (IV) administration of phenytoin with or without extravasation.[3]

PGS's pathogenesis is not well understood. However, Edward JJ et al report that it might be related to the crystallization of phenytoin that extravasates into the interstitial tissue after passing into contact with blood.[5]

Another mechanism of Yoshikawa et all said due to the rupture of the endothelial–intercellular junctions following leakage of phenytoin and irritation of the soft tissue.[6]

Age, indication for using phenytoin, dose of phenytoin, and the number of IV phenytoin doses received are all known risk factors for PGS. It is more likely to occur in individuals who are 60 years of age or older, get phenytoin for the treatment of acute seizures, or receive high dosages and repeated IV doses of phenytoin.[7]

Hanna et al report another risk factor for PGS that has less scientific validity is the presence of conditions that weaken vascular and skin integrity.

Following the cessation of IV phenytoin, Analgesia, the elevation of the injured limb, compression, massage, and mild heat are all initial care techniques. Stop using phenytoin and switch to a different antiepileptic.

The majority of PGS occurrences are minor and treatable without leaving any lasting effects.

The management is largely encouraging. PGS, however, has a chance of developing into compartment syndrome and limb ischemia. The condition of the neurovascular system must be often monitored. If perfusion is compromised, a vascular investigation should be carried out.

Amputation had been reported to be needed in 10.1% of cases of patients with PGS. Avoiding phenytoin may help prevent purple glove syndrome may use if another medication, such as valproate, has a similar level of effectiveness. Oral phenytoin is preferred in all other cases. [2]

Table 1: Causality assessment scale using Naranjo's adverse drug reaction probability scale

Questions	Yes	No	Do not know	Phenytoin score
Are there previous conclusive reports on this reaction?	+1	0	0	+1
Did the adverse event appear after the suspected drug was administered?	+2	-1	0	+2
Did the adverse reaction improve when the drug was discontinued or a specific antagonist was administered?	+1	0	0	+1
Did the adverse event reappear when the drug was re-administered?	+2	-1	0	0
Are there alternative causes (other than the drug) that could on their own have caused the reaction?	-1	+2	0	+2
Did the reaction reappear when a placebo was given?	-1	+1	0	0
Was the drug detected in blood (or other fluids) in concentrations known to be toxic?	+1	0	0	0
Was the reaction more severe when the dose was increased or less severe when the dose was decreased?	+1	0	0	0
Did the patient have a similar reaction to the same or similar drugs in any previous exposure?	+1	0	0	0
Was the adverse event confirmed by any objective evidence?	+1	0	0	+1
Total				7

The Naranjo Adverse Drug Reaction Causality assessment scale assigned a score of 7, indicating phenytoin as the *Probable* cause of PGS in this case (Table 1).

Conclusion

The intravenous phenytoin-induced purple glove syndrome is a rare complication that causes delayed soft tissue loss around the intravenous phenytoin infusion site. Such medications should be handled carefully to avoid difficulties in the future. Early detection of this illness can result in early treatment.

PGS can be difficult for physicians despite the existence of several clinical trials, long-term observations, and scientific hypotheses.

By using a substitutive agent that is equivalent in terms of efficacy, PGS may be averted. Early detection and rapid monitoring and management are essential for an occurrence to be restored. Even though phenytoin dramatically increases the risk of PGS, by increasing the understanding of induction risk factors, morbidity of this dreadful medication reaction can be reduced.

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Inform Consent: Inform consent was obtained by the patient by signing the form.

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