"WHY HER HAND BECOME PURPLE?"

CASE REPORT OF A RARE PURPLE GLOVE SYNDROME FOLLOWING INTRAVENOUS PHENYTOIN ADMINISTRATION

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Introduction

Phenytoin has long been used in emergency setting for treatment of seizure[8] and seizure prophylaxis[8]. It is preferred in Malaysia's Emergency and Trauma Department (ETD) for management of status epilepticus as it is readily available and less sedating[8]. Phenytoin is widely known to cause cardiac arrhythmias and hypotension[1,8], whilst purple glove syndrome (PGS) is a rare complication. It is rarely reported due to the rarity of its occurrence. Here we reported a case of purple glove syndrome following intravenous (IV) Phenytoin infusion.

Case report

An 83 years old lady, with underlying epilepsy, presented to Emergency and Trauma Department (ETD) with twice episodes of seizure at home, each lasted less than five minutes. Upon arrival, patient was asymptomatic. She had missed her oral Phenytoin since three days prior to presentation. Examination of systems was unremarkable. During observation, she developed an episode of seizure and was decided for Phenytoin load intravenously.

Phenytoin 1000mg (20mg/kg) was loaded via 20G cannula at the dorsum of right hand in one hour duration. 50 minutes after Phenytoin initiation, her right hand noted to be swollen and discoloured (purplish discolouration, refer Figure 1); otherwise, patient was pain-free and comfortable. The hand was not tense; the ulnar and radial arteries were palpable, with normal capillary refill time (CRT). Phenytoin was immediately stopped. The hand was managed as probable extravasation injury - magnesium sulphate ointment applied, cold compression and limb elevation done. The limb was continuously monitored. She was referred to Orthopaedic team for further evaluation of the hand.

After two hours observation, the discoloration noted to be subsided, except at the palmar aspect and fingers. Patient was subsequently admitted for seizure management. Patient had full resolution of PSG after 24 hours, and was discharged home after completing seizure treatment.

Figures

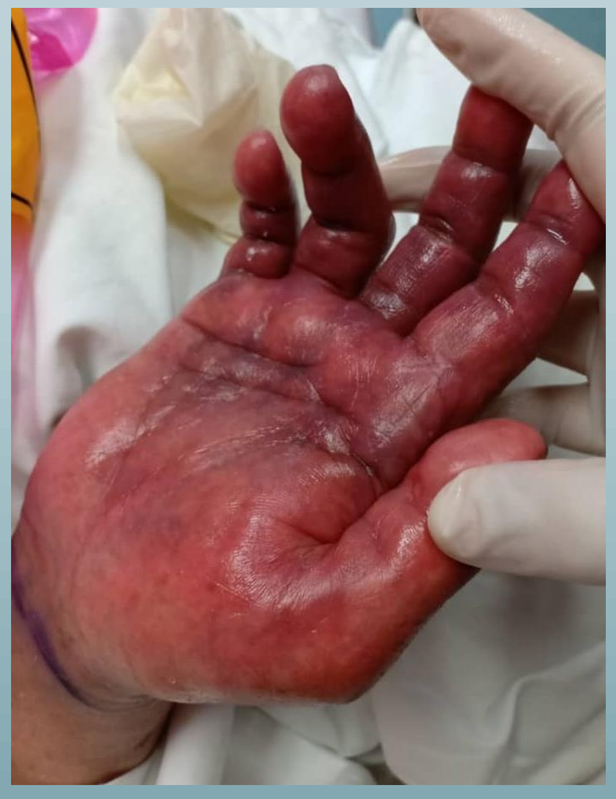

Figure 1 Palmar aspect: purplish and oedematous right hand, 4 hours after Phenytoin administration

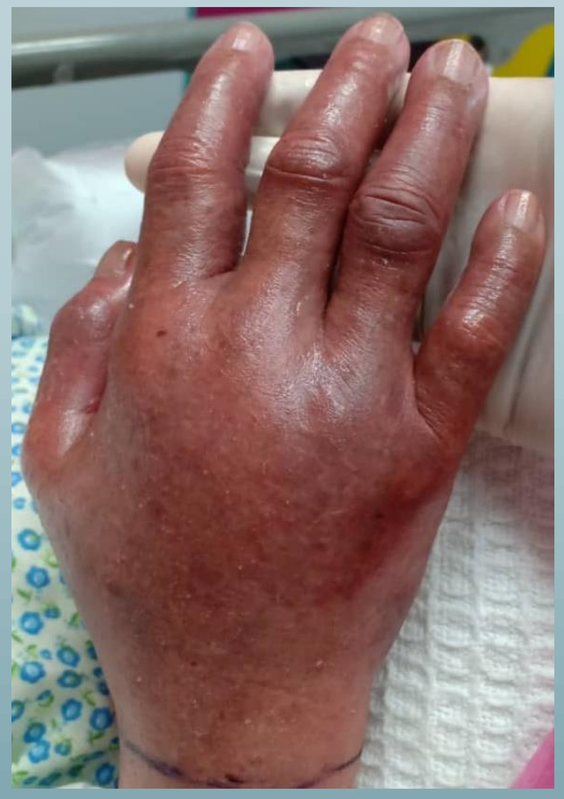

Figure 2 Dorsum aspect: site of intravenous access, oedematous right hand, 4 hours after Phenytoin administration

Discussion

Purple glove syndrome (PGS) is a rare complication following IV Phenytoin administration, which may occur with or without extravasation. To the best of our knowledge, this is the first case of PGS reported in Malaysia. With a score of 7 in Naranjo Adverse Drug Reaction Probability Scale, Phenytoin is a plausible cause of PGS[2]. Although we had seen only once (this patient), the incidence of PGS may be as high as 1-7% in patient receiving IV Phenytoin[3], which suggest it is under diagnosed or under reported. Retrospectively, patient with PSG might be treated as extravasation injury as the latter carries higher morbidity and medicolegal impact, making the PSG under reported.

PGS is defined as pain, purple-bluish discoloration and oedema of limb receiving IV Phenytoin[2–4]. Initially coined in 1992, its pathophysiology still remained poorly understood[3]. PGS is described in three stages of progression; pain and purple-bluish discoloration which typically appears 2 to 12 hours after administration, followed by oedema, and lastly resolution of symptoms[2,4]., Garbovsky *et al* described a direr event in second stage by which the oedema worsened, causing dermal and subcutaneous tissue ischaemia leading to permanent tissue necrosis[3].

The proposed underlying mechanisms befall on its chemical properties, wherein Phenytoin's high alkalinity, pH 12 may have cause local vasoconstriction at the site of IV injection, leading to vascular compromise and endothelial interstitial junction disruption, causing a leakage into soft tissue[4] even though without evident of extravasation. In addition, as IV Phenytoin is very insoluble, sodium hydroxide, propylene glycol, ethanol are added to it[1,2]. The three former compounds are known soft tissue irritant, and may cause PGS if extravasated. Oedema followed as the result of increased interstitial oncotic pressure caused by protein-bound Phenytoin[2,4]. PGS is also hypothesized to be caused by higher than recommended dose of Phenytoin administration[2,5]. This is supported by reports of this syndrome in patient receiving oral Phenytoin, causing bilateral upper and lower limbs purple-bluish discoloration with oedema; namely purple gloves and socks syndrome[1,6,7].

The recognized risk factors include older age (>60 years old), female, acute care setting, infusion rate (>25mg/min) of Phenytoin and usage of small IV access (<20)[2,3,5]. As our patient, being an elderly woman predisposed her to develop PGS. Having had the non-modifiable risk factors (elderly, woman and acute care setting), using a larger IV access might have prevented the development of PGS in this case. In addition, a routine thrombophlebitis checklist is recommended in patients receiving Phenytoin or any infusers (as they may remain drowsy post-ictally), to have early detection and recognition of extravasation or PSG if any.

Conclusion

Management of uncomplicated PGS mainly are supportive. Pain management with elevation followed by cold compression remain the mainstay of treatment. In some cases, fasciotomy may require in relieving affected compartment, whilst in a more severe cases, amputation of limb is required[2,3,5]. Fortunately in our patient, her recovery was uneventful.

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