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Anaphylactic Reaction to Sodium Tetradecyl Sulfate after Sclerotherapy: A Case Report.

Réaction anaphylactique après slérothérapie au sodium tétradécyl sulfate : à propos d'un cas.

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Summary

Sodium Tetradecyl Sulfate is a detergent sclerosant that has been used for decades to treat varicose veins with a high level of safety.

It is important to emphasize that although uncommon, serious allergic reactions to this medicine can and do occur in patients who have been treated many times with no previous issues.

The treating physician and staff should be prepared for an anaphylactic event and have all the necessary tools available in the office should such a situation occur.

Keywords: *Sodium Tetradecyl Sulfate, Anaphylactic Choc, Sclerotherapy, Varicose Veins.*

Résumé

Le sodium tétradécyl sulfate est un détergent qui est utilisé de façon très sécuritaire depuis des décennies pour le traitement des veines variqueuses.
Malgré le taux peu élevé de complications sérieuses avec ce médicament, il est d'importance capitale d'insister sur le fait que des complications allergiques sérieuses peuvent survenir et surviennent chez des patients qui ont été traités plusieurs fois sans incident.
Le médecin traitant et son équipe doivent être préparés pour un choc anaphylactique et doivent être munis d'une trousse d'urgence complète dans l'éventualité qu'un tel incident se présente.

Mots-clés : sodium tétradécyl sulfate, choc anaphylactique, sclérothérapie, veines variqueuses.

Introduction

Sodium Tetradecyl Sulfate is a detergent chemical that was developed in the mid-twentieth century. It has been used for many decades as a sclerosant with a high level of safety and efficacy.

This chemical achieves vein clearance by a process called "protein theft denaturation" in which the drug causes irreversible damage to the inner cellular lining of the vein wall after intravenous injection [1].

Chemically, this drug is unique unto itself and unrelated to other commonly used sulphur-containing pharmacologics that normally have a strong allergic potential. The functional group on this drug is a terminal oxygen, then attached to a sulphur atom which is then surrounded by three more Oxygen atoms (Sulfate has the empirical formula SO_4^{2-}).

Drugs that can be commonly confused with STS are those with a "sulfa"-looking or sounding name.

One good example is when patients report an allergy to "sulfa/sulpha drugs". These antibiotics have, as their functional group, a sulfonamide group which comprises a sulphur atom, two oxygen atoms and a nitrogen atom with attached hydrocarbons or hydrogen atoms ($R\text{-}SO_2\text{-}N\text{-}R_2$).

There have been reports of anaphylactic reaction and pulmonary embolism following intravenous injection of sodium tetradecyl sulfate [2, 3, 4]. The total number of deaths related to anaphylactoid reaction are quite low, a total of five in the literature.

The local Canadian manufacturing drug company (Omega, Montreal Canada) list the absolute contraindications as: recent dvt, pelvic malignancy, arterial disease, infections, hyperthyroidism, uncontrolled diabetes mellitus and asthma. Additionally those who have had an immediate hypersensitivity to the drug should avoid exposure to it.

The reported incidences of allergic reaction after injection range from 0.15 to 0.30% with symptoms that include facial flushing, urticaria, dizziness, tachycardia, shortness of breath, nausea and vomiting, and abdominal pain [5].

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Little emphasis is normally placed on the potential for allergic reaction to this product as it is a seemingly rare occurrence. Allergic sensitization to any chemical can occur at any time, from shortly after the first treatment session to years later with another repeated exposure.

Clinical case report

This article presents a case of a female patient who was well known to us for previous Sclerotherapy treatments and developed a new, immediate Type I hypersensitivity reaction to sodium tetradecyl sulfate which required urgent airway management and subsequent hospitalization.

A 57 year old female patient presented to us in 2007 for assessment of varicose veins. At this time her past medical history was significant for osteoarthritis and occasional vasovagal episodes of unknown origin. Her medications included Lipitor 10 mg OD and ASA 81 mg OD.

She did report an allergy to sulphonamide antibiotics but she could not recall which one as well as an allergy to penicillin. Both medications had caused a diffuse rash after administration many years ago. She returned to the clinic in early 2008, for sclerotherapy treatment sessions.

At the first visit, she received 5.0 cc of 3% STS foam solution (liquid: air mixture) at a ratio of 1:5.

The patient did well after treatment with compression therapy and returned again later that month for further sclerotherapy sessions using varying concentrations and amounts of STS sclerosant solution.

In total, over the past 3 years prior to this incident, she has had 6 treatments with both liquid and foamed STS solutions.

On her seventh session, we treated her right small saphenous vein with 5.0 cc of 3% STS foam solution with proximal compression of the SSV followed by inversion and application of a compression stocking.

Within 2 minutes, the patient became short of breath, anxious, agitated and slightly flushed. She told us she was having difficulty breathing and quickly deteriorated after this point. Approximately one minute later the patient went flaccid, unconscious and started to regurgitate her stomach contents.

We treated this patient immediately as an anaphylactic reaction, placed her in the recovery position to open her airway, expel her stomach contents and monitor her status. We then injected an antihistamine (diphenhydramine HCl 50 mg IM) and epinephrine (1.0 cc 1:1000 SC) in addition to giving her supplemental oxygen (at 5L/min) because her blood oxygen saturation had dipped into the low eighties. CPR was not needed as she was breathing spontaneously on her own and once supplemental oxygen was added, her oxygen saturation returned to normal. She was transferred to a local emergency department where she was then kept for observation overnight.

Additional doses of epinephrine were given as well as dexamethasone to prevent a delayed reaction. Intubation was not required although the emergency physician noted significant airway edema on her admission.

She was discharged the following morning after an uneventful overnight stay. I saw the patient 2 weeks later in good health and suffering no long term effects of her life-threatening reaction.

Discussion

Although the likelihood of an allergic or less likely, anaphylactic reaction is relatively rare, every phlebologist should be prepared to deal with this type of situation.

Preparation is key with nursing and support staff being able to recognize and allergic hypersensitivity reaction when it occurs and then call the physician immediately. Having the proper medication on hand and is also of vital importance. Every phlebologist should have epinephrine, diphenhydramine hydrochloride and oxygen available for the patient that experiences this type of reaction. Due to the quick reaction of our staff and availability of all treatment modalities this patient survived the incident with no ill-effects.

There has been suggestion that the purity of the solution from different manufacturers may influence the risk of anaphylaxis. A chemical impurity, carbitol, in the manufacturing process may be a potential instigator for an allergic reaction [6], however this is yet to be proven in a controlled trial.

Conclusion

One must be alert and prepared at all times to face a potential anaphylactic reaction with any detergent sclerosing agent.

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