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Iontophoretic delivery of lignocaine and epinephrine

Sir,

Lignocaine, like most local anesthetics, is a vasodilator and causes increased bleeding during surgical procedures. To counter this effect, it is often premixed with epinephrine, which is a powerful vasoconstrictor, at a concentration of 1:100,000 to reverse the vasodilatory response of the tissue to the anesthetic.[1] The pain associated with local anesthetic injections is more when epinephrine is included. This is due to the low pH of solutions necessary to stabilize the epinephrine for a long shelf-life.[2] Iontophoresis is a relatively painless means of delivering medication, whereby a drug having the same charge as the electrode is repelled and driven into the skin.[3] Iontophoretic delivery of lignocaine 2% was effective in reducing the pain of venipuncture and venous cannulation within 10 minutes.[4]

To assess the effectiveness of local anesthesia and for decreasing bleeding during surgery, we conducted a pilot study on ourselves. Iontophoresis was performed with 2 mA of direct current for 15 minutes with lignocaine 2% and epinephrine (1:200,000).

Four 1 inch squares were marked on both forearms with a template. A gauze piece soaked in 2% lignocaine with epinephrine was placed over the right forearm. An aluminium foil 12 cm x 3 cm in size was placed over the gauze piece and secured in place with micropore tape. The anode (positive) plate was placed over the gauze since lignocaine with adrenaline has a net positive charge. The feet were placed over the cathode (negative) plate. Iontophoresis was carried out for 15 minutes following which both test and control sites were tested for touch, pain and bleeding time at 15-minute intervals for 1 hour.

The bleeding time was recorded by a standard method: The blood pressure was maintained at 40 mm Hg on both upper limbs. A lancet was pricked 3 mm deep and the bleeding time recorded with the help of Whatman filter paper No.1 and a stop-watch.[5]

The sensation of touch was unaffected, while pain was decreased after 15 minutes and up to 1 hour. The bleeding time was reduced after 15 minutes and showed a rebound increase at 30 minutes. The anesthetic effects of lignocaine lasted for a longer time (more than 1 hour), while the vasoconstrictive effects of epinephrine were short-lived (15 minutes), with a rebound increase in the bleeding time at 30 minutes.[6],[7]

The study was limited to two volunteers (both authors) since the bleeding time estimation involved multiple pricks over the control site and was painful. Hence a double-blind placebo-controlled study was not undertaken. A larger well-controlled study involved cannulation over the saline control and the site was treated with lignocaine iontophoresis.[8] This study was conducted on children and adults. Since we found a prick test on the untreated site to be very painful, we were not able to justify conducting the study on volunteers.

A randomized, controlled trial compared EMLA (eutectic mixture of local anesthetic) cream and lignocaine iontophoresis for cannulation analgesia.[9] Although EMLA was found to be superior, lignocaine iontophoresis was faster, cheaper and could be used over large areas with ease.[9]

We suggest that since the duration of effectiveness of epinephrine is limited, pre-treatment iontophoresis can be attempted with plain lignocaine 2% to reduce the pain due to multiple needle-stick injury.

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Preventing strongyloidiasis in the immunosuppressed

Sir,

We are writing this letter in response to the case report "Fatal disseminated strongyloidiasis in patients on immunosuppressive therapy: report of two cases" published in the IJDVL of Jan-Feb 2005.[1] We congratulate the authors for this report.

Recently, there was another report of death due to strongyloidiasis hyperinfection in a leprosy patient on treatment with corticosteroids for a type II lepra reaction.[2] These articles highlight the importance of remembering common as well as often neglected infestations that can potentially cause morbidity and mortality in patients of dermatological disorders and in organ transplant recipients on immunosuppressive therapy.

Strongyloidiasis is endemic in tropical and subtropical countries. It is estimated to affect more than 70 million people worldwide. Its prevalence rates are as high as 40% in certain areas, especially West Africa, the Caribbean, and Southeast Asia, including India. Hence, although strongyloidiasis is not given much importance in India, the search for strongyloidiasis in patients with predisposing factors is important. These predisposing factors include any cause of immunosuppression, e.g. use of immunosuppressive agents, malignancy, HIV infection, collagen vascular disease, diabetes mellitus, malnutrition, and advanced age. In patients who were exposed to the parasite, the likelihood of strongyloidiasis should be carefully assessed before immunosuppressive therapy is started.[3] In a case-control study, corticosteroid users were shown to have 3.3 times greater risk of developing strongyloidiasis.[4] Hyperinfection with strongyloidiasis has a high mortality rate (up to 80%) because the diagnosis is often delayed due to the nonspecific presentation in a patient who is immunocompromised. Most immunocompetent patients have asymptomatic chronic infections causing negligible morbidity.[5]