

SILVER NITRATE - A USEFUL AND EFFECTIVE THERAPEUTIC

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Silver nitrate (AgNO_3) has many uses in current practise. It is astringent, styptic and bactericidal. It is highly soluble in water (2 in 1), meaning that 100ml of water will dissolve 200g of silver nitrate. This means that it is possible to work up a 200% concentrated solution where this is appropriate. Silver salts are the basis of photographic processing, the silver products darkening as the image 'develops'. We should avoid contact of the chemical with the skin of our hands because within a short time contaminated skin will display a black mark that looks dirty in the clinical situation and will not wash off. The only way to remove the mark is to abrade the skin with a bur or file, leaving the area sore and sensitive.

When used in solid form, silver nitrate is available as a 95% toughened stick (a 'caustic pencil'). Here the silver nitrate pencil point is toughened by the addition of 5% of potassium nitrate. But even in this toughened form it remains very brittle and is liable to break with the least stress put upon the point. In another solid presentation silver nitrate can be purchased as single use applicators in varying strengths (65%, 75%). These applicators are purchased in the form of long plastic rods with the chemical bonded to the tip at one end, looking very like long matches or vestas. Both of these presentations are applied to skin that has been pre-dampened with water or an aqueous (not spirituous) antiseptic solution. It is not good practice to dip the pencil or applicator, and instruments and dishes will become spoiled and blackened if they become contaminated with dissolved silver. The applicator tips or pencil point are applied directly to the dampened lesions in small circular motions, or 'twirled' in order to dissolve the chemical and work up the maximum concentration. Care should be taken to cover the entire (usually pared) lesion surface and extend 1-1.5mm onto the healthy skin.

A 25% solution, regrettably quite expensive to purchase, is good for application to the painful dorsal nucleated lesion referred to by some workers as a neurovascular corn. Here it will usually cause a temporary grey staining of the immediate area, and it is unlikely that an eschar will be formed. Recurrence of the painful lesion will be deferred, to our patient's advantage. The same is true where application of the 25% solution is made to the enucleated centre of an interdigital heloma molle. Repeat formation of the nucleus will be put off for perhaps several weeks. A tiny twist of cotton wool formed at the end of an orange stick or cotton wool twist applicator will minimise the loss of solution that would be incurred if a normal cotton bud were to be used. Again, the entire lesion surface and a narrow margin of healthy skin should be treated. If 25% soln. is not available, then wetting the skin with alcohol before touching with the applicator will result in a differential low percentage solution being applied and an incomplete (grey) eschar formation.

The solid presentations are indicated for use upon verrucae. On application to the pared surface they immediately coagulate protein to form a layer of silver albuminate. This can be seen as a white halo over the treated area, and this layer resists further penetration of the chemical (not deeper than 0.5 mm). For this reason silver nitrate is a shallow, self-limiting treatment. The treated area hardens and blackens on exposure to light, forming a stiff, plate-like, proteinaceous 'eschar' which, over a period of days, begins to separate at the edges prior to falling off, bringing with it the layer of tissue upon which it lies. By treating a layer, losing that layer, then treating the next layer, downward progress can be made into a viral lesion. Dressings are not required where silver nitrate is applied with the expectation of eschar formation, and might interfere with the natural and intended loss of the eschar.

Silver nitrate 95% rapidly shrinks highly vascular hypergranulation tissue, and this effect can be useful for gaining better visualisation of the nail border and sulcus in onychocryptosis. The solid applicator or liquid solution might also be applied to a bursal sinus in order to break down the columnar epithelial cells that line the sinus and prevent its closure.

Silver nitrate has good styptic properties and will stop quite vigorous haemorrhage, but it stings sharply on application and should not be used habitually to stop minor bleeding. The condition argyria can arise if silver becomes distributed throughout the body.

THE ROLE OF SILVER NITRATE IN CURRENT PRACTICE

Answers should be submitted on A4 paper and should be of sufficient length to demonstrate full understanding of the topic. Single word answers are not permissible. Try to answer in one or two short paragraphs, not more than 1/3rd page per answer.

- Q1. What are the properties of silver nitrate?
- Q2. What precaution should we take when handling silver nitrate?
- Q3. Quote the strength of the ‘caustic pencil’.
- Q4. Contrast the caustic pencil with silver nitrate applicators.
- Q5. How would you work up a 200% solution?
- Q6. How would you achieve a low percentage deposition of silver nitrate?
- Q7. What is the effect of creation of an eshar?
- Q8. How does an eshar act to remove viral infected tissue?
- Q9. What use can we make of silver nitrate in low percentage?
- Q10. How deep can we expect silver nitrate to penetrate?

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