

decreased by using a faster acting drug, such as lignocaine, in a suitable concentration rather than a slower onset drug such as bupivacaine.

The onset of spinal anaesthesia is rapid. There is no advantage in using alkalinised solutions.

Alkalinisation of the solution does not provide any practical advantage in plexus blocks,^{1,7} or intravenous regional anaesthesia.⁸ With blocks of larger peripheral nerves, onset time is decreased and the quality of the block improved by minimising the diffusion distance by injecting the local anaesthetic solution close to the nerve. This can be achieved by using peripheral nerve stimulation, ultrasound guidance or other techniques to accurately position the needle tip.

In infiltration anaesthesia, the onset of the block is generally rapid so there is minimal time to be gained.

Alkalinisation of local anaesthetics to reduce the onset time of regional anaesthesia or major nerve blocks is not useful.

Conclusion

Alkalinisation of local anaesthetic solutions reduces the pain of infiltration. It also reduces the onset of anaesthesia, but the time saved is small.

References

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Conflict of interest: none declared

Self-test questions

The following statements are either true or false (answers on page 195)

3. Injections of lignocaine with adrenaline are less painful if sodium bicarbonate is added to the local anaesthetic solution.
4. Alkalinisation of the solution delays the onset of action of local anaesthetics.

Dental notes

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Local anaesthetic solutions

Dental local anaesthetic solutions are usually contained in premade cartridges, designed for injection without any further mixing or addition. The only exception is 0.5% bupivacaine, with or without adrenaline. It is supplied in vials and so requires the use of a separate syringe. This type of anaesthetic is used by

oral and maxillofacial surgeons for pain control after removal of impacted teeth.

There has been at least one incident where a dentist used an injection of local anaesthetic from a cartridge and then separately injected sodium bicarbonate in an effort to counteract the acidic pH in an area of acute inflammation. This resulted in a permanent nerve injury with adverse medico-legal consequences for the dentist.

It is therefore recommended that dentists do not inject other solutions when using local anaesthetic cartridges.