Tumescent Anesthesia

Pushing the limits of local anesthetic doses

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Background and goal of study

Tumescent Local Anaesthesia (TLA) is a technique consisting of subcutaneous infiltration of large volumes of a dilute local anesthetic solution, usually lidocaine with epinephrine, producing a firm and tense tissue. TLA was described in 1987 by Klein for liposuction totally by local anesthesia, allowing effective analgesia and less blood loss. TLA is a concern for anesthesiologists, as the recommended maximum doses of local anesthetic are largely surpassed by the surgeon, reaching doses of 55 mg/kg of lidocaine, exceeding the defined limit of 7 mg/kg (FDA).¹ This review study aims to assess the safety evidence of TLA regarding local anesthetic dosage.

Materials, Methods and Results

• PubMed search: *tumescence, lidocaine and dosage* 13 articles 4 published in the last 5 years

Discussion

In favor:

- Blocks the sensory stimuli – efficacious/ extended analgesia;
- Procedure without general anesthesia;
- Reduction in blood loss – vasoconstrictive effect;
- Lidocaine absorption is very slow (adrenaline + hydrostatic pressure)
- Plasmatic lidocaine < 5mg/L - rarely associated with toxicity;
- Adrenaline leads to slower absorption - bigger dose of lidocaine;
- Outpatient surgery / office-based environments;
- Part of the solution, that has very low concentration of lidocaine, is removed during liposuction.

Against:

- Maximum safe doses of lidocaine are not consensual (28 to 55 mg/Kg), according to the solution used, addition of adrenaline and possible association with liposuction;
- Risk of late toxicity - peak of absorption 4-12h after infiltration, but the absorption continues beyond 24h;
- Adrenaline toxicity can also occur;
- Higher risk: liver failure, slower metabolism of lidocaine, solution without adrenaline, no suction;
- Risk of wrong preparation or administration – IV administration!

Conclusion

TLA can be considered a safe alternative or combined technique of anesthesia and analgesia in certain procedures. To maximize safety, all anesthesiologists should be aware of the pharmacokinetics and toxicity of tumescent lidocaine, in order to recognize and treat potential complications.