

Comparison of topical Proparacaine and Tetracaine Anaesthesia for Intravitreal Ranibizumab Injections

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Background

- Intravitreal injections are a significant part of our daily work load
- Safe and effective form of anaesthesia is desired
- Options include
 - Topical local anaesthesia
 - Proparacaine, tetracaine, oxybruprocaine, lidocaine
 - Sub-conjunctival anaesthesia
 - Sub-tenons
 - General anaesthesia
- Subconjunctival local anaesthetic has been shown to be a more effective^{1,2}

1. [Kaderli B, Avci R.](#) Comparison of topical and subconjunctival anesthesia in intravitreal injection administrations. [Eur J Ophthalmol.](#) 2006 Sep-Oct;16(5):718-21.
2. [Blaha GR, Tilton EP, Barouch FC, Marx JL.](#) Randomized trial of anesthetic methods for intravitreal injections. [Retina.](#) 2011 Mar;31(3):535-9.

- Several studies have compared efficacy of different choices of topical anaesthetic
 - Tetracaine, lidocaine, cocaine, proparacaine
- Blaha et al - no difference in pain scores comparing lidocaine pledget, proparacaine, tetracaine and subconjunctival lidocaine².
- Rifkin and Schaal - tetracaine group reporting statistically lower pain scores when compared with proparacaine³

2. Blaha GR, Tilton EP, Barouch FC, Marx JL. Randomized trial of anesthetic methods for intravitreal injections. [Retina](#). 2011 Mar;31(3):535-9.

3. [Rifkin L](#), [Schaal S](#). Factors affecting patients' pain intensity during in office intravitreal injection procedure. [Retina](#). 2012 Apr;32(4):696-700.

- Ideal choice is not only in its efficacy in reducing pain during injection alone but post-procedure comfort is important
- Corneal epithelial cell sloughing lasts for up to six hours after instillation⁴
- Tetracaine - cause epithelial cell membrane damage, loss of microvilli and accelerated desquamation of epithelial cells⁵
- Tetracaine four times more toxic compared to Proparacaine⁶

4. [Wilson G, Fullard RJ](#). Cell sloughing with proparacaine. [J Am Optom Assoc](#). 1988 Sep;59(9):701-2.

5. [Boljka M, Kolar G, Vidensek J](#). Toxic side effects of local anaesthetics on the human cornea. [Br J Ophthalmol](#). 1994 May;78(5):386-9.

6. [Grant RL, Acosta D](#). Comparative toxicity of tetracaine, proparacaine and cocaine evaluated with primary cultures of rabbit corneal epithelial cells. [Exp Eye Res](#). 1994 Apr;58(4):469-78.

Objective

- To assess the efficacy of proparacaine hydrochloride 0.5% and tetracaine hydrochloride 0.5% as an anaesthetic during intravitreal injections of Ranibizumab
- To survey and compare ocular discomfort experienced by patients seven hours post procedure following use of proparacaine and tetracaine

Methods

- Prospective non-randomized study
- Patients receiving intravitreal Ranibizumad treatment for neovascular age related macular degeneration were included
- Four week period – 16th January to 13th February 2013
- Local anaesthetic used documented
- Patients were given three drops in total

Methods (2)

- Patients asked after injection to rate pain experienced from 0 – no pain to 10 – worst pain ever
- Patients were contacted seven hours later(provided they consented) and asked if they experienced
 - No discomfort at all
 - Mild foreign body / gritty sensation
 - Moderate discomfort
 - Severe discomfort requiring analgesia / contact health services
- Exclusion criteria
 - Virgin eyes
 - Non Ranibizumab injections

Results

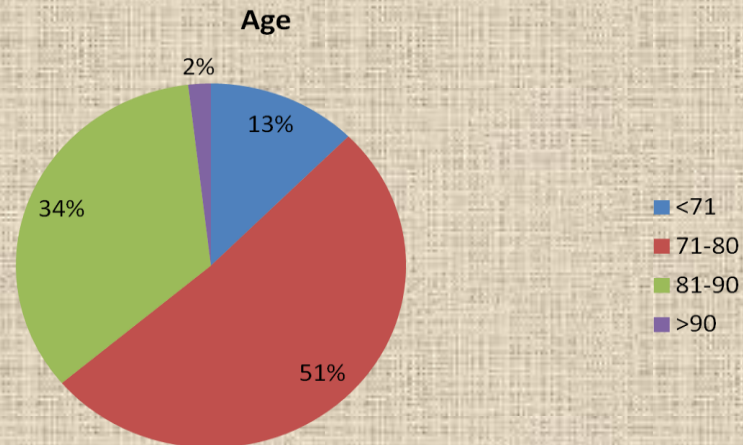
- 121 patients included
- 64 patients had proxymetacaine
- 57 patients had tetracaine
- 13 patients were not contactable (7 from proparacaine group and 6 from tetracaine group)

Results (2)

- Demographics

	Proparacaine	Tetracaine
n	64	57
Male	29	21
Female	35	36
Age (mean)	77.7	78.9

- Age distribution

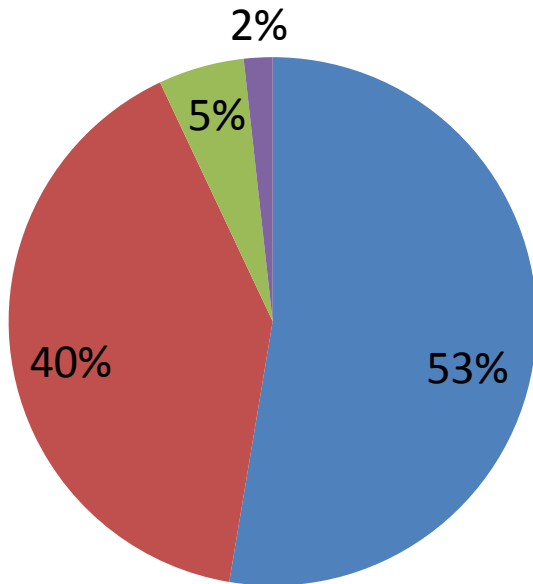


- Anaesthesia / Pain score

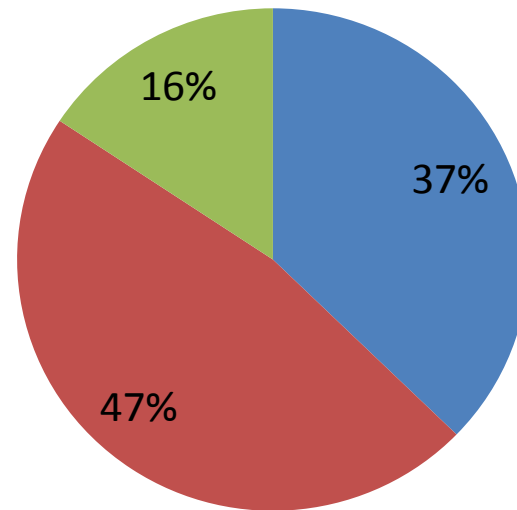
	Proparacaine	Tetracaine	
Injection experience (mean)	1.12	0.91	p = 0.364 Unpaired t-test
No pain / discomfort post injection (n)	30 (52.6%)	19 (37.0%)	p = 0.125 Fisher's exact

Post Injection Experience

Proxymetacaine



Tetracaine



- No pain at all
- Mild
- Moderate
- Severe

Conclusion

- No significant difference in anaesthetic/pain experience during injection between proparacaine and tetracaine
- Although a higher percentage of patients had a better post procedure experience with proparacaine, it is not significant statistically
- Post procedure discomfort could be related to corneal toxicity secondary to local anaesthesia however this study did not assess that directly
- Overall, 55% of patients experienced discomfort