Phenylephrine Added to Tropicamide Eye Drops Does Not Influence Oxygen Saturation or Vessel Diameter in Oximetry.
E. Vandewalle¹, L.A. Pinto², O.B. Ölofsdottir³ and I. Stalmans¹


ABSTRACT

The aim of this study was to evaluate whether the addition of phenylephrine 5% to tropicamide 0.5% in the protocol for dilation affects the retinal vessel oxygen measurements in glaucoma patients. To test whether phenylephrine has an influence as a vasoconstrictor on the retinal vessel width and on the quality of the obtained retinal images in glaucoma patients.

OBJECTIVE

The aim of this study was to evaluate whether the addition of phenylephrine 5% to tropicamide 0.5% in the protocol for dilation affects the retinal vessel oxygen measurements, and to test whether phenylephrine 5% had an influence as a vasoconstrictor on the retinal vessel width and on the quality of the obtained images.

METHODS

Fifty primary open-angle glaucoma (POAG) and 26 normal tension glaucoma (NTG) patients were obtained before and after the administration of phenylephrine 5% eye drops of patients already dilated with tropicamide 0.5% with the Oxymap Retinal Oximeter (Oxymp ey. Reykjavik, Iceland). Specialized software, Oxymap Analyzer, analyzed the images and measured the oxygen saturation and vessel diameter. Oxygen saturation was measured in first and second degree vessels. A Mann-Whitney U test was used to compare both groups. Quality of the pictures was assessed and a Fisher exact test was used.

RESULTS

There was no significant difference in arterial and venous oxygen saturation in glaucoma patients whether diltated by tropicamide alone or a combination of tropicamide and phenylephrine (97±4% vs 97±4%, p=0.27 and 95±5% vs 95±5%, p=0.77 for arterial saturation and 66±5% vs 66±5%, p=0.86 and 65±5% vs 65±5%, p=0.73 for venous saturation in POAG and NTG, respectively). There was no significant difference in vessel diameter between both protocols for the different vessels (p=0.98 and p=0.27 for arterial saturation and p=0.68 and p=0.20 for venous saturation in respectively POAG and NTG). The quality of the pictures was significant better in the group that received the combination (p=0.006 and p=0.001 in respectively POAG and NTG).

CONCLUSIONS:

The combination of topical phenylephrine 5% and tropicamide 0.5% improved the quality of retinal oximetry images without influencing the oxygen saturation or vessel diameter.

BACKGROUND

In previous retinal oximetry reports, different protocols for pupil dilation are used: dilation with tropicamide 1% supplemented with phenylephrine hydrochloride 10% when needed (Hardarson et al. 2009; Hardarson & Stefánsson 2010; Hardarson & Stefánsson 2011; Hardarson & Stefánsson 2012; Ölofsdottir et al. 2011), tropicamide 1% alone (Hardarson et al. 2009) and the combination of tropicamide and phenylephrine (Blandal et al. 2011).

RESULTS

Table 1: Baseline characteristics

| No. patients | 51 |
| NTG | 26 |
| POAG | 25 |
| Gender | 22 men, 29 women |
| Age, mean ± SD, y | 62 ± 13 |
| Intracocular pressure, mean ± SD, mmHg | 14 ± 4 |
| Systolic blood pressure, mean ± SD, mmHg | 150 ± 27* |
| Diastolic blood pressure, mean ± SD, mmHg | 83 ± 13* |
| No. of glaucoma medications | 1.8 ± 1.4 |
| Trabeculectomy | 7 |

Table 2: Retinal oxygen saturation values (%) and retinal vessel width (pixels) after pupil dilation with tropicamide 0.5% alone and the combination of tropicamide 0.5% and phenylephrine 5%.

Table 3: Quality of the obtained oximetry pictures

Figure: Oximetry pictures

CONCLUSIONS

The addition of topical phenylephrine 5% after tropicamide 0.5% improved the quality of retinal oximetry images without influencing the retinal oxygen saturation values or the retinal vessel diameter in glaucoma patients.

Reference