

# **Safety of Phenylephrine 2.5% Eye Drops for Pupillary Dilatation**

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Adequate mydriasis is essential for obtaining acceptable and gradable fundus photographs for diabetic retinopathy screening. The commonly used eye drops for pupillary dilatation is Tropicamide 1% or 0.5%. However, the muscles of the iris are frequently resistant to these eye drops and adequate mydriasis is difficult to obtain with these drops alone. Phenylephrine (10% or 2.5% eye drops) acts synergistically with Tropicamide and result in superior mydriasis. Concerns have been raised about the cardio-vascular side-effects of 2.5% Phenylephrine Eye Drops when used for pupillary dilatation, and optometrists are reluctant to use these drops for mydriasis. We undertook a review of the literature to assess the safety of topical Phenylephrine 2.5% eye drops when used for mydriasis.

## **Review of Literature:-**

In a young healthy adult the upper limit of safety for *intravenous* administration of phenylephrine is 1.5mg<sup>1</sup> and Kumar *et al*<sup>2</sup> have found that phenylephrine plasma levels after topical administration of the 2.5% drops is 0 – 1.720ng/ml after 20 minutes. Symons *et al*<sup>3</sup> reported no significant change in the mean systolic and diastolic blood pressure in 126 patients receiving 10% phenylephrine. Malhotra *et al*<sup>4</sup> in their study on 54 cases showed no difference in systemic cardiovascular effects of either the 2.5% or the 10% concentration. Bhatia *et al*<sup>5</sup> found no statistically or clinically significant increase in blood pressure after instillation of 10% drops in 87% of normotensive and 76% of hypertensive patients. Mild rise of blood pressure (3 mm Hg systolic (SD 19.03); and 1 mm Hg diastolic (SD 11.5) was seen in 11% of normotensive and 15% of hypertensive patients. Motta *et al*<sup>6</sup> found no changes in blood pressure or heart rate after instilling one drop of 2.5% or 10% phenylephrine drops in their group of 58 patients. Brown *et al* found no change in mean blood pressure or pulse rate after instillation of 10% phenylephrine in 100 patients<sup>7</sup>. Phenylephrine 2.5% is licensed for use in all age groups but the 10% drops are unlicensed in children and not recommended in this age group<sup>8</sup>.

Chin *et al*<sup>9</sup> have reported significant increase in blood pressure after instillation of one drop of 2.5% or 10% phenylephrine pre-operatively. However, their study does not appear to take into account the effects of anxiety or adrenaline administered with the local anaesthetic prior to surgery. Samantaray and Thomas<sup>10</sup> also reported a definite increase in blood pressure after topical use of phenylephrine in all of their cases.

## **Conclusion:-**

The consensus of opinion, after review of all the available literature, appears to suggest that instillation of **one** drop of **2.5%** phenylephrine eye drops in conjunction with Tropicamide 1% eye drops is safe and effective, except in children (below 12 years of age) or where there are any contraindications. We believe that advice to instil one drop of 2.5% phenylephrine if adequate mydriasis is not obtained with Tropicamide 1% alone should be included in the protocol for pupillary dilatation for the Central Mersey Cluster for Diabetic Retinopathy Screening, subject to approval of the Programme Board.

## **References:-**

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